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GUIDE
TO THE
GREAT GAME ANIMALS
(Ungulata)

THE DEPARTMENT OF ZOOLOGY,
BRITISH MUSEUM (NATURAL HISTORY),
CROMWELL ROAD, LONDON, S.W.

ILLUSTRATED BY 52 TEXT AND OTHER FIGURES.

LONDON:
PRINTED BY ORDER OF THE DIRECTOR OF THE
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1907.

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FROM

Museum

Frontispiece.



THE AFRICAN ELEPHANT (*Elephas africanus*)

in the Central Hall.

Height 11 feet 4 inches.

GUIDE
TO THE
GREAT GAME ANIMALS
(UNGULATA)

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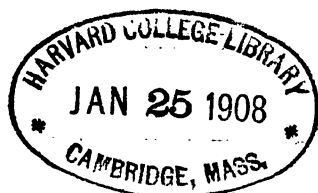
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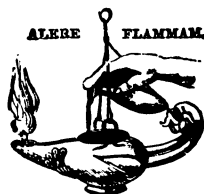
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The Museum.



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P R E F A C E.

THE exhibited collection of Great Game Animals of the order Ungulata in the Museum is of such extent and of such general interest, more especially to sportsmen (to whose generosity its growth is largely due), that it has been deemed advisable it should form the subject of a special "Guide."

This Guide (like the descriptive labels in the cases upon which it is based) has been compiled by Mr. R. Lydekker, who has made a special study of many of the animals to which it is devoted. The treatment of the subject is considerably fuller than is the case in the Guide to the Mammal Collection generally. Limitations of space have, however, rendered it impossible in many instances to give detailed notices of the various species, so that the descriptive portion is in the main devoted to the characteristics of the different genera and families. The scientific names employed in the Galleries have of necessity been adopted; these being to some extent a compromise between extreme views.

The collection of Great Game Animals of the order under consideration occupies a considerable extent of the Lower Mammal Gallery on the first floor of the western half of the building, as well as the whole of the adjacent West Corridor

and the greater portion of the East and South Corridors. Reference is, however, also made to many of the domesticated representatives of the order Ungulata exhibited on the ground-floor in the North Hall.

In many of the groups of Mammals the exhibited series is limited to the display of specimens of only a comparatively small percentage of the known species. On account of the exceptional interest of the present group a very much larger proportion of the species is, however, shown to the public, and it may be hoped that it will eventually be found possible to exhibit all the larger species of which specimens are procurable.

E. RAY LANKESTER,

Director.

BRITISH MUSEUM (NATURAL HISTORY).

October, 1906.

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GUIDE

TO

GREAT GAME ANIMALS.

WITH the exception of the large Carnivora, such as lions, tigers, leopards, bears, and wolves, all the animals coming under the designation of "Great Game" are included in the group or "order" of Hoofed Mammals, or UNGULATA. Of these animals the collection exhibited in the galleries of the Museum is remarkably fine and, in fact, unique. Although most of the members of the group are of considerable or large dimensions, a certain number are comparatively small. It will, however, be obvious that the entire group must come within the scope of the present guide.

As a whole, the Ungulata or Hoofed Mammals are specially adapted for a life on the ground and, in the main, to subsist on vegetable food, although a few are mixed feeders. In accordance with the needs of such a diet, their molar, or cheek, teeth have broad crowns, the summits of which carry tubercles or ridges well suited for crushing and grinding vegetable substances. Their feet are protected in some cases with blunt, broad nails, but in the greater number of species with hoofs, which more or less completely enclose the terminal joints of the toes on which they mainly or entirely walk.

The large bodily size of so many of the members of this order renders it very difficult to arrange them all in their proper

sequence in a Museum. It has been necessary not only to make them occupy most of the central line of the Lower Mammal Gallery, but also to overflow into the West and East Corridors; while the Elephants have been removed to the Central Hall and the Geological Department, so as to be in association with their extinct relatives.

The great majority of existing Ungulates are included in the two subgroups, or suborders, Perissodactyla and Artiodactyla, of which the latter is much more numerously represented than the former. A large number of the members of the order—more especially the Artiodactyla—are furnished with horns. These present several structural types, representatives of which are exhibited in the West Corridor behind the Kudu case.

I. The simplest type is that of the Giraffe, in which three bony prominences—a single one in front and a pair behind—quite separate from the underlying bones and covered during life with skin, occupy the front surface of the skull. The summits of the hind pair are surmounted by bristly hairs. In the extinct *Sivatherium* (of which a skull is shown in the East Corridor) there are two pairs of such appendages, the hinder being large and probably covered during life either with skin or thin horn. In the male Okapi there are small bony caps, comparable to antlers, to the simple skin-covered horns.

II. In the Asiatic Muntjac Deer we find a pair of skin-covered horns, or "pedicles," corresponding to the paired horns of the Giraffe, although welded to the skull. From the summits of these pedicles arise secondary outgrowths, at first covered with skin, which (owing to the growth of a ring of bone at the base arresting the flow of blood) eventually dries up and leaves bare bone incapable of further growth. In the Muntjac the bare bony part, or "antler," is small in proportion to the skin-covered pedicle, and simple in structure; but in the majority of Deer, as in the Roebuck (of which antlers in the skin, or "velvet," and also in the clean condition are shown), the antler increases in size at the expense of the pedicle—which dwindles—and in some species, like the Sambar and Red Deer, becomes very large and more or less branched. Owing to liability to necrosis, the permanent retention of such a mass of dead bone would be dangerous; and the antlers

are consequently shed annually (or every few years) to be renewed the following year, when, till the animal becomes past its prime, they are larger than their predecessors. The periodical shedding is also necessary in order to allow of this increase in size. With the exception of the Reindeer, antlers are confined to the males.

III. A third type of horn is presented by the American Prongbuck, or Pronghorn, in which bony processes, or "cores," corresponding to the horns of the Giraffe, have acquired a horny sheath, in place of skin; the sheath being in this instance forked, and annually shed and renewed, although the core is simple. The sheaths are akin to hair in structure, thus suggesting affinity with the hairs surmounting the Giraffe's horns. Female Prongbuck may or may not have horns.

IV. In the great majority of "Hollow-horned Ruminants," such as Oxen, Sheep, Goats, and Antelopes, the horny sheath (or true "horn") forms a simple unbranched cone, which may be compressed, spirally twisted, or curved in one or more directions, but is permanently retained and continues to grow throughout life from the base, while it becomes worn away at the tip. Some of the leading modifications of this type of horn are shown in the West Corridor and described in special labels. Rarely, as in the Four-horned Antelope, there are two pairs of horns. In many cases these horns are present in both sexes.

V. The last type is that of the Rhinoceros, in which the one or two unpaired horns consist throughout of "horny" matter (that is to say, hair-like fibres closely welded together), with merely a slight hollow at the base which fits upon a corresponding elevation on the skull. Apparently this type of horn has had an entirely independent origin, starting as a small horny nodule and gradually increasing in size. The idea that it can have been derived from a horn of the Ruminant type by the gradual dwindling of the core and the solidification of the sheath seems to be negatived by the fact that the early Rhinoceroses were hornless. These horns are present in both sexes.

SUBORDER PERISSODACTYLA.

[Lower
Mammal
Gallery.
Cases
37 to 40,
and two
cases
in the
central
line.]

In this group the middle, or third, toe of both fore and hind feet (fig. 2) is larger than any of the others and symmetrical in itself, its centre constituting the middle line or axis of the whole foot. This may be the only toe present, as in Horses (fig. 1), or the second and fourth may be subequally developed on each side of it. In the Tapirs the fifth toe is also present in the fore-foot, but no existing species shows any trace of a first toe. This group at the

FIG. 1.



FIG. 2.



Bones of the Left Fore-foot of a Horse (1) and a Rhinoceros (2).

r, radius; *u*, ulna; *c*, carpus; *mc*, metacarpus; *ph*, phalanges.

present time consists of only three distinct families, the Tapirs, Rhinoceroses, and Horses (including Asses and Zebras); all these being poor in genera and species, and evidently, as shown by the evidence of fossil remains, merely the surviving remnants of a very extensive and varied assemblage of animals which flourished on the earth during almost the whole of the Tertiary geological period. The two domesticated species, the Horse and the Ass, have been largely multiplied and widely dispersed over the surface of the

earth by human agency, but the others have mostly a very restricted geographical range.

The Tapirs. The Tapirs form a family of Perissodactyla remarkable at the present day for their anomalous geographical distribution, one species (*Tapirus indicus*, 991) inhabiting the Malay countries, whereas the other four are confined to Central and South America. The clue to this peculiarity is afforded by extinct species, remains of which occur in the Tertiary rocks of Europe, China, and North America. From other living members of the suborder, Tapirs are distinguished by having four front-toes; the hind-feet, as in the Rhinoceroses, terminating in three digits. The nose is prolonged into a short proboscis, and the molar teeth of both jaws are low-crowned, and carry simple transverse crests, united in the upper ones by an outer wall. The number of teeth is 42, or only two below the full typical complement. The heavy form of the body, the small size of the eyes, and the shortness of the tail, are shown in the specimens exhibited. In the typical members of the genus, like the Malay *T. indicus* (991) and the American *T. terrestris* (992), the nasal region of the skull is of normal structure; but in two of the American species (*Tapirus bairdi*, 993, and *T. dowi*) a bony partition divides the cavity of the nose into two divisions. These two species are in consequence separated generically, or subgenerically, as *Tapirula*. The young of all are spotted and striped.

[Lower
Mammal
Gallery.
Case 36.]

Tapirs are dwellers in dense forest, where water is abundant. In this they swim, and even dive, while they also enjoy wallowing in mud, and in the deep forest wander about during the day, generally alone. Although usually slow in their movements, when frightened they make violent rushes. Their food consists of leaves, twigs, and fruits.

Rhinoceroses. Rhinoceroses are the largest and bulkiest of the existing Perissodactyla; and although now confined to Africa and the Indo-Malay countries, in past epochs ranged over the greater part of Europe and North America. Their most distinctive feature is the presence

[Lower
Mammal
Gallery.
Cases
37* & 40,
H & J.]

of one or two horns in the middle line of the fore-part of the head; this, together with the presence of only three front toes, in the living forms, distinguishing them from the Tapirs. The upper molar teeth are of a more complex type than those of the latter; and the lower molars have curved, instead of straight, cross-crests. The horns, as stated above, are attached only to the skin, and have no connection with the bones of the skull. Rhinoceroses have very thick skins—which may be thrown into folds and carry but a scanty covering of hair—small eyes, and moderate-sized, tubular ears. They show but little intelligence, and although usually timid in disposition, display great ferocity when brought to bay. Whereas, however, the African species attack with their horns, those from Asia make use of their lower tusks. Although the sight is dull, their senses of smell and hearing are acute. Some kinds browse on the boughs of trees, and others graze on grass; but all are fond of water and of wallowing in the mud.

Asiatic Rhinoceroses.

Three species of Rhinoceros are recognised from Asia, in all of which the skin is thrown into definite folds or flaps; while cutting-teeth are present in the front of the jaws, and the nasal bones of the skull are pointed. By far the largest of the three is the Great Indian Rhinoceros (*Rhinoceros unicornis*, 999, fig. 3 c), in which the folds of the skin are very strongly marked, and there are large tubercles on the hind-quarters. Only a single horn is present; and the fold across the shoulders is not continued over the back. The upper teeth are of a complex type, with a flat plane of wear. This Rhinoceros inhabits the tall grass-jungles of Assam, in which it forms "runs," or tunnels, completely concealed from view. The specimen exhibited was presented by H.H. The Maharaja of Cooch-Bihar. The species is confined to India. The smaller Javan Rhinoceros *R. sondaicus*, 1000) differs by the fold in front of the shoulder being continued across the neck, and by the small polygonal plates on the skin. The molar teeth are of a simpler type than in the last, and wear into ridges. This species, of which a young specimen and a skull are exhibited, ranges from the Sandarbans of Bengal to Java. In the Sumatran Rhinoceros (*R. [Diceros-rhinus] sumatrensis*, 1001) the molars are of the same type as in



FIG. 3.—Heads of Burchell's or White Rhinoceros (*Rhinoceros smus*) (a), Common or Black Rhinoceros (*R. bicornis*) (b), and Great Indian Rhinoceros (*R. unicornis*) (c).

the last, but there are two horns, and the skin is smoother, with no fold crossing in front of the shoulder. Although variable in this respect, this species is the most hairy of all the Rhinoceroses, as it is the smallest. Its range extends from the Bengal Sandarbans to Sumatra, and there are several local races; the two specimens exhibited belonging to the dark-coloured Malay race.

African Rhinoceroses.

Africa is the home of two species of Rhinoceros, in both of which there are no distinct folds in the skin; teeth are absent from the front of the jaws of

[Case 37.]

the adult, there are two large horns placed close together, and the nasal bones of the skull are blunt and rounded. Of the two species, the larger is the White Rhinoceros, also known as Burchell's or the Square-mouthed Rhinoceros (*Rhinoceros [Dicerus] simus*, 1002, fig. 3 a), formerly numerous in the districts to the north of the Orange River, but now nearly exterminated, although existing in Central Equatorial Africa near Lado. The most distinctive external features of this species are the short and truncated muzzle, and non-prehensile upper lip; but it is also well characterised by the very complex pattern of the grinding-surface of the upper molar teeth, which become worn quite flat. Its food consists solely of grass.

[Case H.]

In the Common, or Black, Rhinoceros (*R. [Dicerus] bicornis*, 1003, fig. 3 b) the upper lip is distinctly prehensile, and the upper molar teeth are of a simpler type, their grinding-surfaces being ridged. This species feeds entirely on leaves and twigs. There is great variation in respect to the relative lengths of the two horns; those individuals in which the second is as long as or longer than the first have received the name of Keitloa.

[Lower Mammal Gallery. Cases 38, 39 & 39*.]

Horses.

Family Equidæ.

This family, which includes true Horses, Zebras, and Asses, is now represented only by the genus *Equus*, although in past times there were several other types. From the other two existing families of Perissodactyla, modern *Equidæ* are distinguished by the tall crowns and complex structure of their cheek-teeth, in which all the hollows and valleys formed by the infoldings of enamel are filled by cement, so as to form a grinding surface of a perfect type. Another feature is the presence of an infolding of the enamel in the summits of the incisors, thus producing what is called the

"mark." In the skull the enclosure of the socket of the eye by a complete bony ring is also unknown in the other members of the suborder. In all existing Horses there is only one toe on each foot, although rudiments of lateral digits are represented by the "splint-bones" on each side of the upper end of the cannon-bones. In the extinct three-toed Horses (*Hipparion*) there were three complete digits to each foot, although the lateral pair was small. In the earlier *Anchitherium* the lateral toes were relatively larger, and the molar teeth had short crowns, with the valleys free from cement. From this animal there is a transition to the small four-toed *Hyracotherium*, which was not larger than a fox, and formed one of the earliest ancestors of the family. A series of specimens illustrating the ancestry of the Horse, and another displaying the alterations in the teeth with age are shown in the North Hall. Horses, Zebras and Asses are inhabitants of open plains, where they wander in droves headed by an old stallion.

The Horse. The Horse (*Equus caballus*) is markedly distinguished from the other species of the genus by having the tail completely clothed with long hairs, and by the long flowing mane. It has bare callosities on both pairs of limbs, instead of on the front pair alone; and the head is relatively smaller, the ears are shorter, the limbs longer, and the hoofs broader.

Two distinct types of Horse, in many instances largely modified by inter-breeding, appear to exist.

1st.—The Northern, or Dun type, represented by the Dun Ponies of Norway (*Equus caballus typicus*), the closely allied Celtic Pony (*E. c. celticus*), of Iceland, the Hebrides, etc., and the Wild Pony of Mongolia (*E. c. przewalskii*), to which the now extinct Tarpan of the Russian steppes appears to have come very close. The prevalent colour is yellow-dun, with dark brown or black mane, tail, and legs; in the wild breed the muzzle is often white and the root of the tail short-haired; while the head is relatively large and heavy. No depression exists in the skull in front of the eye. Most of the ordinary Horses of N.W. Europe are descended from the dun type, with more or less admixture of Barb blood.

2nd.—The Southern, or Barb type, represented by Barbs, Arabs, Thoroughbreds, etc. (*E. c. asiaticus*, or *libycus*), in which the

typical colour is bay with black "points" and often a white star on the forehead, and the mane and tail are long and full. The skull generally shows a slight depression in front of the socket of the eye. Many of the dark-coloured Horses of Europe have Barb or Arab blood in their veins, this being markedly the case with the Old English Black, or Shire Horse, the skull of which shows a distinct depression in front of the eye-socket. This depression is still more marked in the extinct Indian *E. sivalensis*, which may have been the ancestral form.

[North
Hall.]

In this connection, attention may be directed to the series of skulls of famous Thoroughbred and Shire Horses exhibited in the North Hall. The skulls of Race-Horses include those of "Stockwell," "Bend-Or," "Ormonde," and "Donovan"; while Shires are represented by "Blaisdon Conqueror" and "Prince William," both famous horses in their time. The presence in the skull of Thoroughbreds and Arabs of the above-mentioned slight depression in front of the socket of each eye is noteworthy, since this, although now serving as the attachment for the muscle running to the nostril, may represent a much deeper depression in the skull of the extinct three-toed *Hipparion* (shown in a Table-case in the North Hall), which has been regarded as the receptacle for a face-gland like that of Deer and many Antelopes. The limb-bones of "Stockwell" and "Blaisdon Conqueror" are exhibited in a wall-case in order to show the difference between the Thoroughbred and the Cart-Horse types.

[Lower
Mammal
Gallery.
Case 39*.]

Asiatic Wild Asses.

Asses resemble the Horse in the absence of stripes, although there may be a dark streak down the back, and at times another across the shoulders, and bands on the limbs. The Asiatic Asses, which might well be collectively called Kiangs or Onagers, have moderate ears, the tail rather long, and the back-stripe dark brown and running from head to tail. On the neck and withers this stripe is formed by the mane. They come nearer to the Horse than do any other members of the family. There are two species of Asiatic Wild Ass, with several varieties. The first and largest has two races—the Chigetai (*Equus hemionus*) of Mongolia, and the Kiang (*E. h. kiang*, 1013) of Tibet, which is a redder animal. The Onager (*E. onager*), of which there are several races, is smaller, with a

broad dorsal stripe, bordered with white; the colour varying from sandy to greyish. This species ranges from Baluchistan and N.W. India to Persia, Syria and Arabia.

These Asses inhabit desert plains, or open tableland; the Kiang dwelling at elevations of about 14,000 feet. They are generally found in herds of from twenty to forty, although occasionally in larger numbers. All are fleet, and traverse rough ground with speed. On the lowlands they feed on dry grasses, and in Tibet on small woody plants. In India and Persia they are difficult to approach, although this is not the case in Tibet.

The Zebras and Quaggas.

Zebras and Quaggas, which are confined to Africa south of the Sahara, are recognisable by being more or less fully striped. The largest is Grévy's Zebra (*Equus grevyi*, 1025, fig. 4), distinguished by its large and broad ears, which are very hairy inside, the narrow and more numerous stripes, with a peculiar arrangement of their own, the tall mane, extending on to the withers, and the thickly-haired tail. A second subgroup is represented by the Quagga (*Equus quagga*, 1017), now extinct, and Burchell's Zebra (*Equus burchelli*), locally known as the Bonte-Quagga (1018). They have small narrow ears, broader stripes, which extend across the lower surface of the body, and smaller manes. In the Quagga, a South African species, the stripes are confined to the head and fore-part of the body. In the typical race of Burchell's Zebra, now nearly extinct, but formerly abounding on the plains north of the Orange River, the lower part of the hind-quarters and both legs were devoid of stripes. Further north there are numerous races of this species, such as *E. burchelli crawshayi* (1019) in which the legs are more or less fully striped, while in *E. burchelli granti* (1020), of N.E. Africa, the striping extends to the hoofs. In that race the stripes are alternately black and white, instead of brown or buff, without the intervening "shadow-stripes," of the southern races. Lastly, there is the True or Mountain Zebra (*Equus zebra*, 1024) of the Mountains of Cape Colony, represented in Angola by *E. z. penricei*. In this animal the ears are longer and the whole build is much more like that of the African Wild Asses, although the direction of the hair along the spine is reversed. The stripes do not extend across the under surface of the body; a distinctive

[Lower
Mammal
Gallery.
Cases
38 & 39.]

feature being the presence of transverse bars connecting the back-stripe with the oblique stripes on the hind-quarters. A Zebra from N.E. Rhodesia has been named *E. annectans*. The exhibited specimen of the Quagga is the one presented in 1858 by

FIG. 4.

Head of Grévy's Zebra (*Equus grevyi*).

Sir George Grey to the London Zoological Gardens, where it lived for many years.

[Lower
Mammal
Gallery.
Case 39*.]

African Wild Asses.

The last group of the *Equidæ* is represented by the Wild Asses of North Africa and their domesticated descendants, all of which are included under the designation of *Equus asinus* (1014 & 1015). The very long and pointed ears, the prevailing bluish grey colour, with a stripe on the back and shoulders, or bars on the legs (or both combined), the small hoofs, and the smooth, terminally-tufted tail are the distinctive features of this species, of which there are two wild races. The

larger of these is the Somali Wild Ass (*E. asinus somaliensis*, 1015), distinguished by the absence of stripes on the back and shoulders and the presence of dark barrings on the legs; it is represented by a specimen shot by Lt.-Col. A. Paget. Side by side with this is an example of the smaller Nubian race (*E. a. africanus*, 1014), from the Atbara River, presented in 1904 by the Hon. Charles Rothschild, which shows the narrow stripe along the middle of the back, and the broader but very short one across the shoulders characteristic of the race, in which the legs are uniformly coloured.

SUBORDER ARTIODACTYLA.

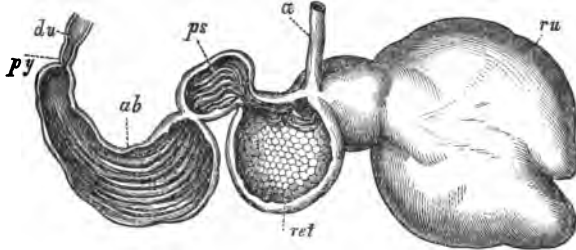
The members of this suborder are distinguished from the Perissodactyla by numerous anatomical peculiarities, among which the structure of the limbs is the most striking externally. The third and fourth toes of all the feet are almost equally developed and flattened on their inner or contiguous surfaces, so that each is not symmetrical in itself, but when the two are placed together they form a figure symmetrically disposed to a line drawn between them (the so-called "cloven hoof"). Or, in other words, the axis, or median line of the whole foot is a line drawn between the third and fourth toes. These may be the only toes present, or there may be also the second and fifth, but always of much smaller size. A large number of species have a pair of horns or antlers growing from the frontal bones. This group includes the Hollow-horned Ruminants (Oxen, Sheep, Goats, and Antelopes), Giraffes, Deer, Chevrotains, Camels, and Pigs. They (especially the first-named) are now the dominating members of the great Ungulate order, widespread in geographical range, rich in generic and specific variation, and numerous in individuals.

[Lower Mammal Gallery. Cases 41 to 66; most of the cases in the central line of the gallery, and all those in the Corridors.]

Hollow-horned Ruminants. The *Bovidae*, *Antilocapridae*, *Giraffidae*, and *Cervidae* collectively constitute the section PECORA, or True Ruminants. In all this extensive group of Artiodactyle Ungulates there are no upper incisor teeth, and the lower canines, or tusks, are approximated to the incisors to make a uniform series. The molar teeth, which are frequently very tall, have the columns

forming their crowns completely crescentic; and the premolars are of the same general structure as the molars, although simpler. In both limbs the third and fourth metapodial (metacarpal and metatarsal) bones are united to form a cannon-bone, which terminates below in a pair of pulley-like surfaces for the bones of the toes. Internally these Ruminants are characterised by the complex structure of the stomach, which is divided into four distinct compartments (as shown in fig. 5), each differing in size, conformation, and function from the other.

FIG. 5.



The Stomach of a Sheep, cut open to show the internal structure.

æ, œsophagus, or gullet; *ru*, rumen, or paunch; *ret*, reticulum, or honey-comb; *ps*, psalterium, or manyplies; *ab*, abomasum; *py*, pylorus; *du*, duodenum, the commencement of the small intestine.

As a family, the *Bovidæ* (which include Oxen, Sheep, Goats, and Antelopes) are chiefly characterised by the possession—at least in the males—of hollow, unbranched horns, which, at all events after very early life, are never shed, and are supported on bony cores of nearly similar form. In none of them are upper canine teeth normally present; and the lower canines (fig. 38 B, p. 50) have narrow simple crowns, similar to those of the incisors with which they form a continuous series. When lateral hoofs are retained, these are never supported by more than mere nodules of bone.

Wild Oxen. Under the title of Oxen may be included not only the domesticated animals properly so called, but likewise
Genus Bos. Bison, Yak, and Buffaloes. They are nearly all

[Cases
41-44.]

large, heavily built Ruminants, with short necks, and massive heads; both sexes being furnished with long horns, and the males generally having a dewlap on the throat and chest. The horns are

situated high up on the head, and may be either rounded or triangular, but never have the transverse ridges of those of the Sheep or the knobs of the Goats. The broad muzzle is moist and naked, and there are no glands below the eye. The upper molar teeth differ from those of Sheep and Goats by their nearly square section, and have an additional column on the inner side.

Some members of the group inhabit open grassy plains, but others frequent forests, and the Yak is found in the highlands of Tibet. Except the Anoa, they live in herds, which may comprise thousands of individuals, and are headed by bulls. Some very old bulls may, however, become solitary. Their food consists either of leaves, twigs, and grasses, or various marsh-plants. Usually only one calf is produced at a birth.

Typical Oxen. The Aurochs, or Urus—the old Wild Ox of Europe—

Bos taurus. is now completely extinct as a wild species, although most European domestic breeds may be regarded as its more or less modified descendants. The remains of this Ox

(*Bos taurus primigenius*) occur abundantly in the fens and river-gravels of Britain, and—as exemplified by the skull and limb-bones exhibited—indicate an animal of enormous size and strength. In Britain this original race appears to have become extinct by the time of Cæsar—at least in the southern parts of the country; but on the Continent it survived to a very much later date. In England it was succeeded by the so-called Celtic Shorthorn (*Bos taurus longifrons*), which appears to have been a domesticated breed. The half-wild white cattle of Chillingham and some other British Parks have been regarded as the direct wild descendants of the Aurochs, but they are really domesticated albino breeds nearly related to the black Pembroke cattle (of which a head is exhibited). The Pembroke breed appears to be very closely allied to the Aurochs, which is known to have been black, with a lighter stripe down the back. A mounted specimen of a bull of the white cattle of Chillingham Park, Northumberland, presented by the Earl of Tankerville, is exhibited; while the head of a cow and the skeleton of a bull are likewise shown. Of the white cattle formerly kept at Chartley Park, Staffordshire,—most of the remnant of which was transferred in 1905 to Woburn Abbey—the mounted head and the skull of a cow, presented by the Duke of Bedford,

[North
Hall.]

are exhibited in the North Hall. All the white Park Cattle have black or red ears, which is itself an indication of their derivation from a dark-coloured breed; and it is noteworthy that there is a white breed of Pembroke Cattle with black feet, muzzles, and ears, which is practically identical with the Chillingham Park cattle.

The black Spanish Fighting Bulls, of which a specimen (presented by Mr. E. F. Johnston in 1902) is exhibited, are probably also nearly related to the Aurochs, and show a similar pale-coloured stripe down the back. It has likewise been suggested that the fawn and white Siemental Cattle of Switzerland, a miniature model of a bull of which is shown, are near akin to the ancient Wild Ox.

The Ankole Cattle of Uganda, characterised by the enormous size of the horns, as shown in a mounted head and a skull presented by Lt.-Col. Delmé Radcliffe, appear to be allied to the ancient Egyptian breed, of which skulls (from tombs) are also exhibited. To this breed the name *Bos aegyptiacus* has been given, as it appears to be markedly distinct from the Aurochs group.

Humped Oxen. The ordinary Cattle of India, as well as those from many parts of Africa, Madagascar, and China,

Bos indicus. differ from European breeds by the presence of a

fleshy hump on the shoulders, the convexity (in place of concavity) of the first curve of the horns, and the presence of a white ring round the eyes and another round each fetlock. The colouring, too, is of a different type, while the voice and habits are also distinct from those of European Cattle. Humped Cattle, or Zebu, belong indeed to a separate species (*Bos indicus*), the wild ancestor of which is extinct and unknown. A Brahmini or Zebu bull is exhibited in the North Hall, where horns of the Galla breed of Humped Cattle, characterised by the immense size of these appendages, are also shown. Not improbably the fawn-coloured Spanish Draught Cattle—of which two heads belonging to animals formerly kept at Osborne, and presented by His Majesty the King in 1902, are exhibited—have a strain of Zebu blood. The evidence for this is afforded by the form and curvature of the horns, and the presence of indistinct white rings round the eyes. Tradition also points to the existence of such a cross.

[North
Hall.]

Indo-Malay Wild Oxen.

Subgenus Bibos.

The Gaur, *Bos* [*Bibos*] *gaurus* 1031, the Gayal, *B.* [*B.*] *frontalis* 1030, and the Banting, or Bantin, *B.* [*B.*] *sondaicus* 1027, [Lower Mammal Gallery, Case 42.]

form a group of Cattle confined to the Indo-Malay countries, showing the following distinctive features. The horns are more or less flattened, especially in the bulls; the tail is shorter than in the typical Oxen, reaching at most only a little below the hocks; and there is a distinct ridge running from the shoulders to the middle of the back, where it ends in a sharp drop. In the adult males the colour of the short hair is usually dark brown or blackish; but in the young of both sexes, as well as in the female Banting at all ages, it is reddish brown; while in the Burmese race of the Banting, known locally as the Tsaine (1028), the colour of both sexes is pale fawn. From the knees and hocks to the hoofs the legs are white, or whitish. The Gaur is distinguished by the great curved crest between the horns; the same part in the Gayal being straight. The Banting is the smallest of the three; and has rounder horns, the ridge on the back less developed than in the other two, and a white patch on the buttocks.

Gaur, commonly called Indian Bison by sportsmen, are met with in hill-forest from India and Burma to the Malay Peninsula, where they are known as Saladang. A male and female are exhibited. The Gayal is probably nothing more than a domesticated breed of the Gaur; and is kept for its milk by the natives of the hill-districts of North-Eastern India and Tenasserim. A bull is exhibited in the Lower Mammal Gallery and the head of a cow in the North Hall. The Banting ranges from Burma and the Malay Peninsula to Java and Borneo. A domesticated breed (of which a steer is exhibited in the North Hall, presented by Mr. C. B. Kloss in 1905) is kept in the small island of Bali, near Java, whence large numbers are exported to Singapore. The head of the black Javan wild Banting, presented by Baron Van Hockeren-tot-Walien in 1904, and one of the tawny Burmese Tsaine, presented by Mr. R. McD. Hawker in 1900, are exhibited in the Pavilion at the end of the Lower Mammal Gallery.

[Lower Mammal Gallery, Cases 41 to 44, and North Hall.]

[Pavilion
at end of
Lower
Mammal
Gallery.
Case 44.]

The Yak.
Bos [Poëphagus]
grunniens.

This species (1033) is confined to the high-lands of Tibet and adjacent regions, where it occurs both wild and in a more or less domesticated condition; tame Yak being largely employed as beasts of burden in that region. The wild race is always uniformly dark-coloured, but many of the domesticated animals show a considerable amount of white. The Yak appears to form a connecting link between the more typical Oxen and the Bisons; its skull showing many points of resemblance to the latter. Its large and wide-spreading horns are nearly cylindrical. The most distinctive feature of the species is the mass of long hair covering the flanks, limbs, and tail. The voice of the domesticated breed is a grunt. Yaks are extremely impatient of heat, and in summer are found at elevations of from 14,000 to 20,000 feet. They feed on coarse wiry grass, and even when domesticated will not eat corn. Whereas the cows and young go about in large parties, the old bulls are solitary. The latter are very wary, and in the daytime generally rest on some exposed hill-side, where they rely chiefly on their keen sense of smell for protection. The tails of domesticated Yaks are used in India as fly-whisks, and are termed *chowris*. A fine series of skulls and horns, mainly presented by Mr. A. O. Hume, as well as a mounted head presented by Capt. H. Cock, and an entire skin, are exhibited. The entire skin is, however, that of a rather small animal.

The European Bison. In the general form of their horns and the structure of the skull, as well as in the possession of 14 or 15 pairs of ribs, the two species of Bison resemble the Yak rather than the typical Oxen; although their skulls are shorter and more convex than those of the former. They are remarkable for the great height of the fore-quarters, which form a kind of hump at the withers; and also for the mass of crisp dark brown hair covering the top of the head, neck and shoulders, and extending some way down the fore-limbs, and also along the back to the tail, which is thickly tufted at the tip. The European Bison, *Bos [Bison] bonasus* (1034), is a forest-dwelling species, now fast verging on extinction. It is still found in a wild state in the Caucasus, and in the forest of Bielowieza, Lithuania Government of Grodno), a herd has long been protected by the

[Large
Case (44)
in Pavilion
at end of
Lower
Mammal
Gallery.]

Russian Government. In 1880 this herd numbered 600 head, but it has considerably diminished since that date. The species is represented by a bull from the Lithuanian herd presented by [Case 44.] H.I.M. the Tsar of Russia in 1845, and a bull and cow from the Caucasus, killed and presented by Mr. St. George Littledale in 1892. During the Pleistocene epoch (as well as later) the Bison was abundant over the greater part of Europe, but it appears to have become extinct in Britain much sooner than the Aurochs. The Pleistocene Bison is distinguished as *Bos* [*Bison*] *priscus*; a series of skulls is exhibited in the Geological Department.

The American Bison. This species (1035), which is very closely [Case 44.] allied to the European Bison, although with

***Bos* [*Bison*] *bison*.** more abundant hair, relatively weaker hind-quarters, and shorter and more curved horns, formerly existed in hundreds of thousands on the prairies of the North-West, but is now almost exterminated as a wild animal. A small herd is preserved by the U.S. Government in the Yellowstone Park and a few others exist under protection. Bison (or "Buffalo," as they are universally called in America) were typically inhabitants of the open prairies, and thus differed markedly from their European relative. During a large portion of the year they went about in small bands, but during the breeding-season collected in enormous herds. In search of water, they sometimes made long journeys across country; and all the various bands composing a herd migrated southwards in winter. The number of Bison in the great herd on the Arkansas in 1871 was computed at not less than four millions. An alternative name of the species is *B. americanus*.

The Wood-Bison, *Bos* [*Bison*] *bison athapascae*, is a large dark-coloured race inhabiting the North-West districts, and dwelling in partially timbered country. Most or all of the survivors of the species belong to this race, which is very similar to the typical prairie race.

African Buffaloes. The Buffaloes are heavily built Oxen, [Case 44.]

***Bos* [*Bubalus*] *caffer*, etc.** with sparsely haired skin, large ears, long tufted tails, broad muzzles, and massive angulated horns. In having only 13 pairs of ribs they resemble the typical Oxen. African Buffaloes have the hair of the back directed backwards. In the Cape Buffalo, *Bos* [*Bubalus*]

[Cases
41 & 44.]

caffer (1037), the horns do not attain an excessive length, but in old bulls are so expanded and thickened at the base as to form a helmet-like mass protecting the whole forehead. In Eastern Africa the Buffaloes (*B. caffer æquinoctialis*, 1038) have smaller horns, which do not meet in the middle line; and other local races have been named. From the former, which is brown instead of black, there seems to be a transition towards the red Dwarf Buffalo (*B. nanus*, 1039) of West Africa. In South Africa Buffaloes frequent reedy swamps, where they associate in herds of from fifty to a hundred or more individuals. Old bulls may be met with either alone or in small parties of from two or three to eight or ten. The typical Cape Buffalo, in addition to numerous skulls and horns, is represented by a male and female shot by Mr. F. C. Selous; while a male and female of the red Dwarf Buffalo are also shown, the former presented by Mr. C. Beddington in 1900.

Asiatic Buffaloes.

[Pavilion
at end of
Lower
Mammal
Gallery.
Case 44.]

In a wild state the typical form of the Indian Buffalo (*Bos* [*Bubalus*] *bubalis*, 1043), seems to be restricted to India and Ceylon, although some of the Buffaloes found in the Malay Peninsula and Islands probably represent local races. The species has been introduced into Asia Minor, Egypt, Italy, and elsewhere. The large size and wide separation of the horns, as well as the less thickly fringed ears, and the more elongated and narrow head, form marked points of distinction between the Asiatic and the African species. Moreover, all Asiatic Buffaloes are distinguished from the African species by having the hair on the fore part of the back directed forward. The haunts of the Indian Buffalo are the grass-jungles near swamps, in which the grass exceeds twenty feet in height. Here the Buffaloes—like the Indian Rhinoceros—form covered pathways, in which they are completely concealed. The herds frequently include fifty or more individuals. These animals are fond of passing the day in marshes; they are by no means shy, and do much harm to the crops. There are at least two races of the Indian wild Buffalo; one, the ordinary form with much curved horns, and the other, *B. bubalis macrocerus*, with the horns extending almost straight outwards for the greater part of their length, and very long. Of this Assam race, now apparently extinct, the skulls and horns of a bull and cow are exhibited on the top of the Wild Ass

case; and a huge pair of horns—once the property of Sir Hans Sloane—on the south wall of the Pavilion. The Tamarao, or Philippine Buffalo (*B. mindorensis*, 1044), is a smaller animal, in many respects intermediate between the Indian Buffalo and the Anoa, or dwarf Celebes Buffalo (*B. depressicornis*, 1045).

The Anoa.

As already mentioned, the Anoa [Case 44.]

Bos [*Bubalus*] *depressicornis*.

(1045) of Celebes is the smallest and most aberrant of the Oxen.

The horns are peculiar for their upright direction and comparative straightness, although they have the same triangular section as in the Buffaloes. White spots are sometimes present just below the eyes, and there may be white markings on the legs and back; this type of colouring is unlike that of other wild Oxen, and approximates to that of the Antelopes. The horns of the cows are very small. The nearest allies of the Anoa seem to be certain extinct Buffaloes of which the remains are found in the Siwalik Hills of Northern India. In habits the animal appears to resemble the Indian Buffalo. Young Anoa have thick woolly coats, frequently brown in colour, but the skins of the adults are nearly naked and black.

Sheep.

Together with the Goats, the Sheep form a subfamily (*Caprinæ*) of the *Bovidæ* differing from the Oxen (*Bovinæ*) by their slender hairy muzzles, and narrow

Genus Ovis.

upper molar teeth, which have no additional column on the inner side. They pass almost imperceptibly into the Goats. Both sexes usually possess horns, but those of the females are small. In the males the horns are generally angulated, and marked by fine transverse wrinkles; their colour being greenish or brownish. They are directed outwards, and curve in an open spiral, with the tips directed outwards. Although there may be a fringe of hair on the throat, the males have no beard on the chin; and they also lack the strong odour characteristic of the Goats. The upper lip of all Sheep has a vertical groove, connected with the bare skin of the nose. Usually the tail is short; and in all the wild species the coat takes the form of hair, and not of wool. Wild Sheep attain their maximum development, both in respect of number and size, in Central Asia. They associate either in large flocks, or in

[Pavilion at end of Lower Mammal Gallery, & North Hall. Cases 46 to 48.]

family-parties; the old males generally keeping apart from the rest. Although essentially mountain animals, Sheep generally frequent open undulating districts, rather than the precipitous heights to which Goats are partial.

A number of breeds of domesticated Sheep are exhibited in the North Hall, among which special attention may be directed to one from the West Indies (originally a native of Africa) characterised by its hairy coat, the colour of which is very similar to that of the wild Urial Sheep of the Punjab exhibited in the Lower Mammal Gallery. Other breeds of *Ovis aries* (as domesticated sheep are called) are characterised by the development of a mass of fat on the buttocks, while in others, again, the long tail becomes flattened and loaded with fat. Specimens of both these breeds are shown. Yet other Sheep are distinguished by the development of an additional pair of horns; specimens of two distinct Four-horned breeds, one from the Hebrides and the other from South Africa, being exhibited. Very remarkable is the spiral-horned Wallachian Sheep (*O. aries strepsiceros*), characterised by the straight corkscrew-like spiral of the horns, as shown in a mounted ram. This type of horn passes, however, into the ordinary form, through breeds allied to the Indian Hunia Fighting-Sheep, of which a ram is shown.

The long tail of most breeds of tame Sheep is probably a result of domestication, as the Indian Urial and the Sardinian Mouflon, one or both of which probably represents the ancestral stock, are short-tailed.

[Pavilion
at end of
Lower
Mammal
Gallery.
Cases
47 & 48.]

Bighorn Sheep.

Ovis canadensis, etc.

The Wild Sheep of the Rocky Mountains of North America locally known as the "Bighorn," and scientifically as *Ovis canadensis* (or *O. cervina*), is the type of a group of large Sheep characterised by the comparative smoothness of the strongly angulated horns, in which the outer front angle is very prominent, while the inner one is rounded off. The gland on the face is very small. The true Bighorn (1052) is a khaki-coloured Sheep with a large white rump-patch. The Black Bighorn (*O. stonei*, 1053) of the Sticheen and Liard River districts is, on the other hand, a dark-coloured animal; while the White Bighorn (*O. dalli*, 1054) of Alaska is almost pure white: both these having narrower and more pointed horns and smaller ears than the true Bighorn. The Grey Bighorn

(*O. fannini*, 1070) of the Yukon is probably only a variety of the [Cases 47 & 48]
 White Bighorn; and indeed it is a question whether any one of these Sheep is more than a local race of *O. canadensis*. The specimen of the Black Bighorn was presented by Mr. D. T. Hanbury; those of the White Bighorn by Mr. J. T. Studley; and those of the Grey Bighorn by Prince Colloredo Mannsfeld. In North-east Siberia the group is represented by the long-haired grey *O. borealis* (1055), of which a specimen presented by Mr. Talbot Clifton is exhibited, and in Kamchatka by *O. nivicola* (1056); both these being closely allied to the White and the Black American Bighorns.

Argali Sheep.

The Central Asian Wild Sheep known as Argalis differ from the Bighorns by their strongly wrinkled horns, in which the outer front angle is much more pronounced. The gland

FIG. 6.



The Siberian Argali Sheep (*Ovis ammon*).

below the eye is also much larger, and there is consequently a deeper [Case 46.] pit in the skull for its reception. The Siberian Argali (*O. ammon*, 1057, figs. 6 & 8) lacks the ruff on the throat characterising

[Case 46.] the Tibetan *O. hodgsoni* (1858). The former inhabits mountainous country at an elevation of from 3,000 to 4,000 feet, where the slopes are covered with thin forest; but the Tibetan Argali is found at elevations of over 13,000 feet on open and rolling country. Although the old males are very wary and difficult to approach, the females and young males wander in large herds, and exhibit much less wariness. The Siberian Argali is the largest of all the wild Sheep, and has the most massive horns. A mounted specimen in the summer coat, presented by Mr. St. George Littledale, and a head, the gift of Major C. S. Cumberland (fig. 8), as well as numerous skulls, are exhibited. An allied species is Littledale's Sheep (*O. littledalei*, 1059) of the Kuldja district—represented by a head presented by Mr. Littledale—in which the shape and direction of the horns are different, while the muzzle is white. The Saiar Sheep (*O. sairensis*, 1060) of the Saiar or Jair Mountains, is a white-muzzled species of smaller size, represented in the collection by three mounted examples shot and presented by Mr. Littledale.

FIG. 7.

Skull and Horns of Marco Polo's Sheep (*Ovis poli*).

Marco Polo's Sheep.
***Ovis poli*.**

This magnificent wild Sheep (1061) is nearly allied to the Argalis, from which it is mainly distinguished by the more slender and dis-

[Case 46.] tinctly angulated horns of the rams, which form a very open spiral (fig. 7), and the colour of the coat. In habits it closely resembles the Tibetan Argali, but it frequents a less barren country than the latter, the undulating Pamirs being covered in summer with luxuriant grass. In Turki the males are called Kulja, or Gulja, and the females Arkar. The somewhat smaller Sheep from the Thian Shan range described as *Ovis karelini* is only a race of the Pamir species. Marco Polo's Sheep, which is

FIG. 8.



HEAD OF THE SIBERIAN ARGALI SHEEP
(*Ovis ammon*).

FIG. 9.



HEAD OF THE THIAN SHAN IBEX
(*Capra sibirica almasyi*).

(From specimens in the Museum.)

found on the Pamirs at a height of about 16,000 feet above the sea, is named after the great Venetian traveller, Marco Polo, who crossed the Pamirs during his journey through "Tatary" in the latter part of the 13th century. It was not, however, till 1838 that skulls were brought to England by Lieut. Wood, R.N., on the evidence of which the species was named *Ovis poli* by Mr. E. Blyth in 1840. The mounted male specimen was presented by Mr. Littledale; numerous specimens of the skull and horns are exhibited on the tops of the cases.

The Shapo, or Urial Sheep. The wild Sheep known in the Punjab [Case 47.] as the Urial (1083), and in Ladak as

***Ovis vignei*.**

the Shapo (*Ovis vignei*, 1062), is a smaller animal than the Argalis, with less massive horns, and a ruff of long white hair on the throat of the males. It is remarkable on account of inhabiting countries with a widely different climate; the Urial being found in the hot hills of the Punjab at a few hundred feet above the sea-level, and the Shapo at elevations of from twelve to fourteen thousand feet in Ladak and other districts of Tibet. The female has small horns. Several local races of this handsome sheep are known; the range of the species covering a large area in Central Asia, from the frontiers of Persia through Baluchistan and Afghanistan to the Salt Range in the Punjab and Ladak on the Upper Indus.

The Armenian Wild Sheep. This species (1064) resembles the Urial in general size and colour, but has a

***Ovis gmelini*.**

much smaller ruff on the throat, which does not extend nearly so high up, while the spiral formed by the horns of the rams is twisted in the opposite direction. The does are hornless. The species ranges from Asia Minor to the Elburz Mountains in Persia, where there is a distinct local race, represented in the collection by a mounted head presented by the Hon. W. [Case 47.] Erskine, after whom it has been named *O. gmelini erskinei* (1065). The wild Sheep of the Troödos Mountains of Cyprus (*O. ophion*, 1066) is a small form of this species.

The Mouflon Sheep. The Mouflon or Wild Sheep of Sardinia and Corsica, *O. musimon* (1087), is a small dark-

***Ovis musimon*.**

coloured species, characterised by the general absence of horns in the females, and of a ruff on the throat of the males, as well as by the horns having the front outer angle much

[Case 47.] less developed and the wrinkles finer than in the Urial. The Mouflon is stated to have formerly inhabited Greece and Spain, but this requires confirmation. Mouflon associate in flocks of considerable size under the leadership of an old ram ; but during the breeding-season they split up into small parties, each comprising a ram and several ewes. In some Mouflon the females have small horns ; and it is not improbable that the Sardinian and Corsican representatives of the species are respectively distinguished by the presence or absence of horns in this sex. The adult ram exhibited was presented by Mr. Ford Barclay.

The Bharal or Blue Sheep. This Tibetan wild Sheep (1088), representing the subgenus *Pseudòis*, forms one of the connecting links between

[Case 48.] the typical Sheep and the Goats ; the horns of the rams being nearly smooth, with a rounded or sub-quadrangular section at the base, and the curvature of a peculiar form. The face has no gland below the eye, and there is consequently no depression in the same region of the skull. From the more typical wild Sheep this species is further distinguished by the greater relative length of the tail. Bharal are never found below an elevation of about 10,000 feet above the sea-level ; and in summer usually ascend to between 14,000 and 16,000. In general habits, the Bharal is intermediate between other Sheep and the Goats ; but the males lack the strong odour characteristic of the latter. The colouring, especially the black and white on the legs, is also of a goat-like type.

Barbary Wild Sheep, or Arui. Even more aberrant than the Bharal is the Barbary Sheep, Arui or Udad (1089), which is further noticeable

[Case 48.] on account of being the only member of the family found in Africa. The skull and horns present a considerable general resemblance to those of the Bharal, but the throat, chest, and forelimbs are clothed with a mass of long hair, and the length of the tail is considerably greater than in any other wild Sheep. The colour is uniform red. The Arui inhabits the dry southern slopes of the Atlas from Tunis to the Atlantic, but is unknown in the heart of the range. In the Sudan it is found on the mountains nearly as far south as Khartum. It is capable of going for several days without water, and is difficult to detect owing to the

close resemblance of its tawny coat to the limestone rocks of the district. The species alone represents the subgenus *Ammotragus*. The specimen exhibited was presented by Sir E. G. Loder.

Goats. By means of the Bharal Sheep (*Ovis nathura*) and Pallas's Ture or Goat (*Capra cylindricornis*), the [Lower Mammal Gallery. Case 46.]

Genus Capra. Sheep and Goats are so closely connected that it is almost impossible to draw a satisfactory line of distinction between them. The males of the latter have, however, a strong odour, and carry a beard of variable size on the chin. None of the Goats possess a gland beneath the eye—a character which they have in common with the goat-like Sheep. The horns of the males are long, and generally more or less compressed or angulated; and in many species they bear prominent knobs on the front surface. In some kinds they are spirally twisted, and in others scimitar-shaped. In the wild species the females have small horns placed wide apart. The groove on the upper lip is less marked in some species than in Sheep. Goats differ from Sheep in selecting for their habitation the most precipitous and rugged mountains, and are absent from open elevated districts like the Pamirs of Central Asia.

Ture, or Caucasus Goats. The two species of wild Goats—locally known as Ture, or Tur—inhabiting the *C. cylindricornis* & *caucasica*. Caucasus Mountains serve to connect the Bharal with the true Ibex. The more Bharal-like species, known to sportsmen as the Caucasian Bharal, and zoologically as Pallas's Ture (*Capra cylindricornis*, 1080), is from the Eastern Caucasus; while *C. caucasica* (1081) of the Western and Central Caucasus, commonly known as the Caucasian Ibex, is the one which comes nearer to the Ibex. The former species is a brown animal with a short curling head, and blackish, smooth, sub-cylindrical, Bharal-like horns. The latter, on the other hand, is of a uniformly chestnut-red colour, with heavily knotted and upwardly directed Ibex-like horns which form very striking trophies. The mounted adult male specimen of the West Caucasian Ture was presented by Mr. St. George Littledale. [Cases 48 & 49.]

The Wild Goat. The Pasang, or Wild Goat (1082), is the [Case 50.] ancestral stock from which the various domesticated breeds of Goats are mainly derived. The species is characterised by the scimitar-like horns of the males being compressed, and sharply keeled in front; the

front keel bearing irregular prominences and notches. In Europe this Goat was formerly abundant in the Grecian Archipelago, although it now remains only in Crete and Antimilo. It is one of the most active of the Goats, taking leaps of great length with unerring precision. One animal that missed its foothold and fell, is recorded to have saved itself by falling on its horns. In Sind and Baluchistan Pasang are found on barren, rocky hills, but in Asia Minor they frequent forest-clad slopes. The Sind race is distinguished as *C. hircus blythi* (1083)—commonly known among sportsmen as the Sind Ibex; and the small Cretan race as *C. hircus cretensis* (1084).

[North
Hall.]

Numerous breeds of domesticated Goats (*C. hircus*)—some represented by animals that have reverted to a wild condition—are exhibited in the North Hall. Among these, the Angora breed is famed for the length and silkiness of its long white coat; while the brown Sudan, or Theban, breed is noteworthy for the absence of horns in both sexes and its general Sheep-like appearance. The Goats that have run wild in the Azores are remarkable for the straightness and close approximation of their long horns; a skull and horns (presented by Major Chaves) are shown.

[Lower
Mammal
Gallery.
Case 51.]

Ibex.

Capra ibex, etc.

The true Ibex are represented by four very closely allied species; viz.: *C. ibex* (1085) of the Alps, *C. sibirica* (1086) of the Himalaya, Thian Shan, and Siberia, *C. nubiana* (1087) of Arabia and Upper Egypt, and *C. walie* (1088) of Abyssinia. Most are characterised by their more or less uniform coloration, and by the long scimitar-like horns having their front surface broad, flattened, and ornamented by a number of bold transverse knots, or ridges. As a wild animal the Alpine Ibex, or Steinbok, is now nearly exterminated, although some herds are preserved in one or two valleys on the Piedmont side of Monte Rosa. The Himalayan, or Siberian Ibex is a larger animal, with longer horns and a fuller beard. It is represented by several local races, such as the one from the Thian-Shan (fig. 9). The other two species are distinguished by the form of their horns. Ibex inhabit crags and upland grazing-grounds near the snow-level, descending to lower elevations in winter, and sometimes coming near the neighbourhood of villages. Although they occasionally congregate in large numbers, they are usually found in flocks of from six to about twenty head.

FIG. 10.



THE WHITE-MANED SEROW OR GOAT-ANTELOPE (*Nemorhaedus argyrocketes*).
(From a specimen in the Museum.)

The Markhor. In this very variable species of wild Goat (1089) [Case 50.] the horns are twisted in a complete spiral and the beard extends on to the chest and shoulders. **Capra falconeri.** At least four different types of horns are recognisable representing as many local races. The race in which the horns are most divergent and their spiral most open inhabits Astor and Baltistan, while the one with the most upright and closely twisted horns is found in the Suliman range of the Punjab. In habits Markhor resemble other Wild Goats; but whereas the open-horned varieties inhabit lofty pine-clad ranges, the one with closely twisted horns is found among low barren hills where the summer heat is intense. Many domesticated Goats have horns very similar to those of the Markhor, although the spiral almost invariably runs in the opposite direction.

Tahr. The Himalayan Tahr (*Hemitragus jemlaicus*, 1099), [Case 51.]
Genus the smaller Arabian Tahr (*H. jayakari*, 1100), and
Hemitragus. the Nilgiri Wild Goat or Ibex (*H. hylocrius*, 1101), form a group differing from the true Goats by their smaller horns, the absence of a beard in the males, and their longer and narrower skulls. The horns of the females are but little smaller than those of the males. The Himalayan species inhabits the outer ranges of the Himalaya where forest is abundant; females frequenting more open ground than males. The old males keep apart from the females during the summer, and are found in districts where precipitous cliffs are numerous. They are consequently some of the most difficult of all animals to stalk.

Serow, or Goat-Antelopes. The Asiatic Serows belong to a group [Case 52.] (*Rupicaprinæ*) showing affinity with the
Genus Nemorhædus. Antelopes on the one hand and the Goats on the other. Most of the group have short tails, relatively small cylindrical black horns, and the chin devoid of a beard. The Serows, which include some of the largest members of the group, inhabit hilly districts, and, although awkward in gait, are unrivalled in getting over bad ground. The Himalayan species, *Nemorhædus bubalinus* (1104), represented by a specimen presented by Dr. W. T. Blanford, is a solitary animal, nowhere numerous; two or three being found on one hill, and three or four on another. It prefers the rockiest and steepest hill-sides:

[Case 52.] and its favourite resting places are under overhanging rocks or in caves. The Sumatran *N. sumatrensis* (1107) is nearly allied, and very probably only a local race. The white-maned *N. argyrochaetes* (1108, fig. 10) of Central China is noticeable for its brilliant colouring. Other species occur in Tibet and the Malay Peninsula.

Gorals. The Asiatic Gorals are nearly allied to the Serows, from which, in addition to certain peculiarities in the form of the skull, they are chiefly distinguished by possessing a gland below each eye, and a corresponding depression in the skull. Several species are known. Of these, the Brown Himalayan Goral (*U. goral*), commonly found in small parties, but sometimes in pairs, usually frequents grassy hills, or rocky ground clothed with forest; in fine weather feeding only in the mornings and evenings, but when the sky is cloudy grazing throughout the day. The Grey Himalayan Goral (*U. bedfordi*, 1110) is nearly allied; and the group is represented in Burma by *U. evansi*, and by other species in Tibet. In common with Serows, Gorals have the cannon-bone long and slender in both the front and the hind limbs.

The Chamois. The Chamois, Gems, or Izard—as it is called in various parts of Europe—(*Rupicapra tragus* or *R. rupicapra*, 1113), is the typical representative of the group of Goat-like Antelopes, or *Rupicaprinæ*, and differs from all the others by the distinct hook formed by the tips of the black horns. Chamois inhabit most of the mountain-ranges of Central and South Europe, the Pyrenean form (Izard) being a smaller animal, with shorter horns and a more foxy-red colour than the typical Gems of the Alps. They are generally found in the highest Alpine forests, although during summer a certain number of individuals leave the main flock to spend a few weeks or months among the snow-fields and glaciers. As a rule, Chamois associate in flocks of from fifteen to twenty head; but for most part of the year the old bucks live apart from the does. Their food consists of the scanty mountain-herbage and lichens. Generally the female gives birth to a single offspring, although there may be a pair. The young are able to follow their parents almost anywhere when but a day old.

FIG. 11.



THE TIBETAN TAKIN (*Budorcas taxicolor tibetanus*).
(From a specimen in the Museum.)

[To face page 31.]

The Rocky Mountain Goat. This Ruminant, *Oreamnus montanus* (1114), is remarkable for its pure white [Case 52.]

Genus Oreamnus.

coat—a type of coloration very rare among Mammals. During the winter the hair is very long and straight, but in summer is replaced by a much shorter coat. The jet-black horns are very similar to those of the Serows, but behind each is a large globular gland. There is no gland beneath the eye. The cannon-bone in each leg is remarkably short and broad. Although universally known as the Rocky Mountain Goat, the animal is not a Goat in the proper sense of the term; being intermediate between the true Goats and the Antelopes. It is generally found above or close to the upper limits of forests; and although active and agile in climbing, has but little speed. During the warmer part of the year these animals are found alone or in small parties, but in the late autumn and winter they congregate in flocks of considerable size. They are far less shy and wary than most mountain mammals, and are consequently not difficult to stalk.

The Takin. The Takin, *Budorcas taxicolor* (1118), of the [Case 53.]

Genus Budorcas. Mishmi Hills, north of the Assam Valley, is a clumsily built Ruminant resembling the Rocky Mountain Goat in its short and broad cannon-bones, and probably nearly related to that animal, and more remotely to the Serows. From both it is distinguished by the form of its horns, which, after bending downwards and outwards for a short distance, suddenly change their direction and point backwards. Beyond the fact that it is a native of extremely elevated regions in Tibet, nothing has been ascertained with regard to the habits of this Ruminant. The typical Mishmi Takin is mainly a brown animal; but in the Tibetan Takin (*B. taxicolor tibetanus*, 1119, fig. 11), of Eastern Tibet and North-West China, the colour of much of the long hair is golden yellow. Specimens of the two races are shown.

The Musk-Ox. The Musk-Ox (*Ovibos moschatus*, 1047, fig. 12), [Pavilion at end of Lower Mammal Gallery. Case 45.]
Genus Ovibos. which approaches the smaller Oxen in point of size, is probably a relative of the Takin and the Rocky Mountain Goat, with which it agrees in the short cannon-bones. The animal derives its name from the strong musky odour it exhales. A very characteristic feature of the Musk-Ox is to be found in the form of the horns, which are much flattened at their

broad bases, and in old males almost meet one another in the middle line of the skull. As in the Sheep and Goats, most of the muzzle is hairy, and thus very different from the same part in the Oxen, but the upper lip is not grooved. The matted hair of the body is of great length and thickness. Musk-Oxen associate in flocks, usually numbering from twenty to thirty head, although occasionally much more numerous. In habits they are very similar to Sheep; and in the breeding-season the old males fight together with great ferocity. The single offspring is born in May or June. During the Pleistocene epoch the Musk-Ox wandered over Britain and much of the rest of Northern and Central Europe. Two local races exist, the typical North American Musk-Ox and the Greenland Musk-Ox (*O. moschatus wardi*, 1048), the latter distinguished by the presence of white hair on the forehead. Mr. D. T. Hanbury is the donor of one of the mounted male specimens of the typical race, while the example of the Greenland race was presented by Mr. Rowland Ward.

FIG. 12.

The Musk-Ox (*Ovibos moschatus*).

[West
Corridor.]

'Bushbucks.'
' Genus
Tragelaphus.

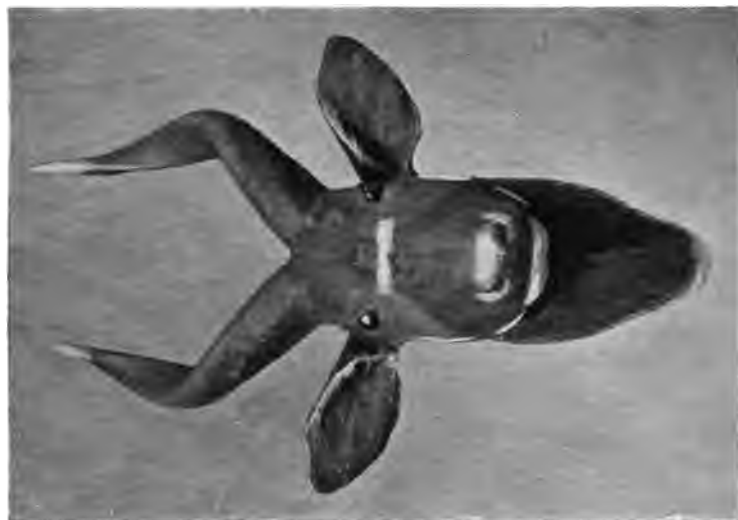
With the Bushbucks (*Tragelaphus*) we come to the first representatives of that indefinable assemblage of Ruminants collectively designated Antelopes, of which there are several subfamilies: the Bushbucks, or Harnessed

FIG. 13.



HEAD OF THE SITUTUNGA ANTELOPE
(*Tragelaphus* [*Linnotragus*] *spekei*).
(From specimens in the Museum.)

FIG. 14.



HEAD OF THE BONGO ANTELOPE
(*Bocercus euryceros*).
(To face page 38.)

Antelopes, together with the Bongo (*Böocercus*), the Elands [*Taurotragus*], Kudus (*Strepsiceros*), and the Indian Nilgai (*Bos-elaphus*), constituting the *Tragelaphinae*, and collectively presenting the following characteristics. Except in the Elands and Bongo, horns are present only in the males, and these are angulated, generally spirally twisted, and without rings. The muzzle is naked, small glands are present on the face below the eyes, and the tail is comparatively long. The Bushbucks are closely allied to the Kudus, from which they chiefly differ by the spiral formed by the horns generally having fewer turns. Many of them, such as the widely spread *T. scriptus* (1201), are brilliantly coloured, the ornamentation taking the form of vertical white lines and rows of spots; and in some cases the sexes often differ in colour, as in the Nyala (*T. angasi*, 1202). Most of the species have hoofs of normal shape, but in some, such as the Situtunga, or Nakong, *Tragelaphus* [*Limnotragus*] *spekei* (1203, fig. 13), these are elongated, so as to be adapted for walking in soft mud; that animal spending most of its time in water, where it stands among reeds with all but its head and horns submerged. The Bongo (*Böocercus eury-ceros*, 1204, fig. 14), of which there is a western and an eastern race, differs by having horns in both sexes, as well as by the tufted tail. It is even more brilliantly coloured than the Bushbucks. The entire specimen exhibited belongs to the eastern race, *B. e. isaaci* (1205), and was obtained by Mr. F. W. Isaac, the discoverer of this race.

Kudu. The two species of Kudu (*Strepsiceros*) are nearly allied to the Bushbucks on the one hand, and to the Elands on the other. From the former they are distinguished chiefly by the more numerous turns in the spirals of the horns of the male; from the latter they differ—among other features—by the much more open spiral formed by the horns of the male, and the absence of these appendages in the female. Both species are characterised by the narrow vertical white stripes on the body and the white markings on the face. The Greater or true Kudu (*Strepsiceros kudu*, *capensis*, or *strepsiceros*, 1206, fig. 16), was formerly widely distributed in South and East Africa, but in many districts its numbers have now been greatly reduced. It is very generally found in hilly country densely covered with thickets, but

it also occurs in thin bush along the banks of rivers, as well as in thorn-jungles on the plains. Kudu associate either in pairs, or in small parties. Their speed is not great. When pursued, they always make for hilly ground. The Lesser Kudu (*S. imberbis*, 1207) is a much smaller species, distinguished by the absence of a fringe of long hair on the throat, and also by the closer spiral formed by the horns of the males (fig. 15). The range of the Greater Kudu extends from South Africa to Somaliland, where it is represented by a local race, *S. kudu chora*. The Lesser Kudu is confined to East and North-East Africa. The exhibited specimen of the Greater Kudu was shot by Mr. F. C. Selous.

Eland. Elands, the largest of Antelopes, are divided into

Genus two species—one (*T. oryx*, 1208) from South

Taurotragus. and South-East Africa, the other (*T. derbianus*, 1209) from West and Central Africa. Nearly allied to the Kudus in the structure of their skulls and the form of their horns and cheek-teeth, they are specially distinguished by the close spiral formed by the horns, which are present in both sexes. In females the horns are longer and more slender than in males. There are three races of the Common Eland, in one of which the body is uniformly coloured, while in a second, *T. oryx livingstonei*, it is marked by narrow vertical white lines. The third race, *T. o. pattersonianus* (1210), of British East Africa, approximates so much to the northern Elands as to suggest that all are really one species. There are two races of *T. derbianus*; the Giant Eland, *T. derbianus gigas*, of the Bahr-el-Ghazal, being the largest of all. *T. derbianus* is characterised by the dark brown neck of the bulls and the white chevron on the forehead. The exhibited specimens of Livingstone's Eland were shot by Mr. F. C. Selous in Mashonaland.

[West
Corridor.
Case XII.]

These animals go about in large herds, and are found alike in desert and wooded districts, and on hills and plains. Although where water is abundant they drink regularly, in parts of the Kalahari Desert the only fluid they obtain is derived from water-melons. They are generally accompanied by Rhinoceros-birds, which give the alarm when danger is at hand. Elands are now exterminated from the Cape, Natal, the Orange River Colony, Griqualand West, and the Transvaal.

FIG. 15.



SKULL AND HORNS OF
THE LESSER KUDU
(*Strepsiceros imberbis*).

FIG. 16.



SKULL AND HORNS OF THE KUDU
(*Strepsiceros kudu*).
(From specimens in the Museum.)

FIG. 17.



HORNS OF THE GEMSBUCK
(*Oryx gazella*).

FIG. 18.



HEAD OF THE NILGAI OR BLUE BULL (*Boselaphus tragocamelus*).
(From a specimen in the Museum.)

[To face page 35.]

The Nilgai. The Nilgai or Blue Bull, *Boselaphus tragocamelus* (1120, fig. 18), of India, alone represents a genus allied to the Bushbucks, but distinguished by the much simpler form of the horns of the males, which are smooth, short, and nearly straight, with a distinctly triangular section at the base, but becoming circular near the tips. The coloration too, is of a different type, the body being nearly uniform bluish grey, while there are white markings on the ears, face, and throat, and white rings above the fetlocks. In build, the Nilgai is a somewhat ungainly creature, owing to the excessive length of the fore-limbs. These Antelopes are found both on the plains and in low hills, generally preferring districts covered with thin bush, or alternations of grassy plains and low jungle. Owing to their being held sacred by the Hindus, they are excessively bold in many districts, and wander through the cornfields where men are at work. The bulls are generally solitary, although occasionally a small number congregate together; but the cows and calves are found in parties usually varying from four to ten in number, although in rare cases containing from fifteen to more than a score.

[Lower
Mammal
Gallery.
Case 53.]

The Sable Antelope Group.

Genus Hippotragus.

The Sable Antelope (*Hippotragus niger*, 1188) and the Roan Antelope (*H. equinus*) belong to a genus nearly related to the Oryxes, with which they form a group, or subfamily. In all these Antelopes long cylindrical horns are present in both sexes; the muzzle is hairy; there is no gland below the eye; the tail is long and tufted; and in the breadth of their tall crowns the upper molar teeth resemble those of the Oxen. The Sable Antelope and its allies (*Hippotragus*) are specially distinguished by the stout and thickly ringed horns rising vertically from a ridge over the eyes at an obtuse angle to the plane of the lower part of the face, and then sweeping backwards in a bold curve. Sable Antelopes are some of the handsomest of the South African Antelopes, and are also endowed with great speed and staying power. They are commonly met with in herds including from ten to twenty individuals, but on rare occasions as many as fifty have been seen together. Forest-clad highlands are their favourite resorts. The Roan Antelope is a larger and lighter-coloured species, with a much wider range, being represented in the Sudan by a separate race (*H. equinus bakeri*, 1188).

[West
Corridor.
Case XI.]

[West
Corridor.
Case X.]

The Addax Antelope.

Genus Addax.

The Addax (*Addax nasomaculatus*, 1190), of North Africa and Syria, is a near relative of the Antelopes of the genus *Hippotragus*, from which it differs structurally by the horns forming an open spiral, ascending nearly in the plane of the face, these being ringed for the greater part of their length. The forehead, neck, throat, and shoulders are clothed in winter with long shaggy hair. In habits, the Addax is very similar to the Oryxes, dwelling in deserts, and being apparently independent of water; its pale colouring, especially in summer, is an adaptation to desert life.

The Oryx Group.

Genus Oryx.

[Cases
VII & X.]

The Gemsbuck (*Oryx gazella*, 1191) of South Africa, with certain allied species, constitutes a genus nearly allied to *Hippotragus*, but distinguished by the straight or recurved horns (fig. 17) sloping backwards more or less nearly in the plane of the face. Oryx, as these Antelopes are collectively called, are found throughout the desert-tracts of Africa, and also in Arabia and Syria. The Gemsbuck (*O. gazella*) is a South African species; in Abyssinia and Somaliland it is replaced by the Beisa Oryx (*O. beisa*, 1192), in which the black markings have a different arrangement; while in East Africa it is represented by the Fringe-eared Oryx (*O. callotis*, 1193). The Scimitar Oryx (*O. algazal*, 1194) is from North-Eastern Central Africa. Oryx are desert Antelopes, generally found in herds of considerable size, although the old males sometimes separate from the others. They are independent of water, and flourish where the vegetation is scanty. The Gemsbuck has been known to kill the Lion by transfixing it with its horns.

The Gazelles.

Genus

Gazella.

[Lower
Mammal
Gallery.]

The Gazelles form the largest genus of the subfamily *Antilopinae*. The subfamily is characterised by the narrow crowns of the molars, which are similar to those of the Sheep, and the hairy muzzle. Generally there are face-glands below the eyes; and the tail is moderate or short. Pits are present in the forehead of the skull, and the horns are ringed for part of their length, with a compressed base; their form being often lyrate, but sometimes spiral. Gazelles inhabit open, and frequently more or less desert districts. They are mostly of a sandy colour, with dark and light markings on the face, and often a dark band on the flanks. The horns are more or less lyrate, and

FIG. 19.



HEAD OF GRANT'S GAZELLE
(*Gazella granti*).

(From specimens in the Museum.)

FIG. 20.



HEAD OF THE HERENUK
(*Lithocranius walleri*).

[To face page 37.]

generally developed in both sexes; there are frequently brushes of hair on the knees. Gazelles may be divided into groups. The one to which the Arabian *Gazella dorcas* (1130) belongs is characterised by the presence of lyrate or sub-lyrate horns in both sexes, and by the white of the buttocks not extending on to the haunches. Nearly allied is the group including the Indian *G. bennetti* (1131) and the Arabian *G. arabica* (1132), in which the horns have a somewhat S-shaped curvature in profile. In the African group, represented by *G. granti* (1133, fig. 19), *G. thomsoni* (1134), *G. mohr* (1135), etc., the white of the buttocks often sends a prolongation on to the flanks, the horns are long, and the size is large. *G. gutturosa* (1136), *G. subgutturosa* (1137), and *G. picticaudata* (1138), form an Asiatic group in which the females are hornless, and the face-markings inconspicuous or wanting. The series of Gazelles exhibited is too large for detailed notice.

[Lower
Mammal
Gallery.
Cases
54-56.]

The Springbuck. The Springbuck (*Antidorcas euchore*, 1122) is nearly related to the Gazelles, from which it is distinguished by the presence on the middle of the loins of an eversible pouch, lined with long white hairs capable of erection. It has also one premolar tooth less in the lower jaw. Formerly these beautiful Antelopes existed in countless numbers on the plains of South Africa, and were in the habit of migrating in droves which completely filled entire valleys. Now they are comparatively rare. They derive their name from their habit of often leaping high in the air when on the move—a habit shared with the Indian Blackbuck. Like the next four Antelopes, the Springbuck represents a genus by itself.

[Case 54.]

The Dibatag. The Somali Dibatag, or Clarke's Gazelle, *Ammodorcas clarkei* (1121), forms a kind of connecting link between the Gazelles and the Gerenuk; this being especially shown in the skull. The face shows the ordinary Gazelle-markings; but the rather short horns—which are wanting in the female—have a peculiar upward and forward curvature, quite unlike that obtaining in the true Gazelles, and somewhat resembling those of the Reedbuck. The neck is longer and more slender than in ordinary Gazelles, and the tail is likewise relatively long. Although local, these animals are fairly common in the interior of

[Case 54.]

Somaliland, where they are known by the name of Dibatag. In running, the head and neck are thrown backwards, while the tail is turned forwards over the back.

The Gerenuk. The East African Gerenuk, or Waller's Gazelle,
Genus *Lithocranius walleri* (1125, figs. 20–22), differs from
Lithocranius. ordinary Gazelles not only by its exceedingly elon-

[Case 54.] gated neck and limbs, but likewise by the peculiar hooked form of the very massive horns of the bucks, the dense structure and straight profile of the skull, and the extreme slenderness of the lower jaw. In Somaliland Gerenuk are found in small family-parties, and feed more by browsing on the branches and leaves of trees and shrubs than by grazing. Frequently they raise themselves by standing on their hind-legs with the fore-feet resting against the trunk of the tree on which they are feeding. Their usual pace is an awkward trot, not unlike that of a Camel; and they seldom break into a gallop.

The Beira Antelope. The Beira, *Dorcatragus megalotis* (1126), of
Genus Somaliland and the adjacent districts, is quite
Dorcatragus. a small Antelope, which presents many points
 [Case 54.] of resemblance to the Dik-diks and their allies, although structurally it appears to be more nearly related to the Gazelles.

The Blackbuck. As now restricted, the genus *Antelope* includes
Genus only the Blackbuck, or Indian Antelope, *Antelope*
Antelope. *cervicapra* (1145), a species characterised by the

[Case 56.] beautiful spiral twist of the horns of the bucks, and the dark colour of the hair of the upper-parts in adult members of the same sex. The glands below the eyes are very largely developed; and there are tufts of hair on the knees, and lateral hoofs to the feet. Blackbuck are found on the open plains of India, from the foot of the Himalaya nearly to Cape Comorin; they frequent both grassy districts and corn-lands. Although the usual number in a herd varies from ten to thirty, or fifty—among which there often will be only a single fully adult sable buck—in some cases the assemblage may include hundreds, or even thousands of individuals. These Antelopes possess great speed, and when running frequently progress by a series of long leaps. In many districts they will allow carts, or even men, to approach very close.

FIG. 21.



MALE AND FEMALE GHERNEK (*Lithocranius valleri*).
(From specimens in the Museum.)

FIG. 22.



ENGRAVED OUTLINE ON SLATE OF GHERNEK FROM
LOWER EGYPT; discovered by Prof. Flinders
Petrie, and believed to date from 5600 B.C.

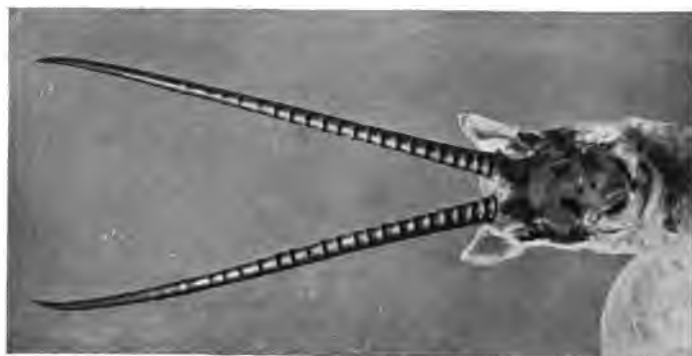
[To face page 38.

FIG. 23.



HEAD OF THE PALLA ANTELOPE
(*Epyceros melampus*).

FIG. 24.



HEAD OF THE CHIRU ANTELOPE
(*Pantholops hodgsoni*).

(From specimens in the Museum.)

[To face page 39.]

The Palla Antelope.

Genus *Epycoros*.

The South African Palla, or Impala, *Epycoros melampus* (1123, fig. 23), is the typical representative of a genus belonging to the group *Antilopinae*, and containing two species. Pallas are distinguished by the lyrate, widely divergent, and somewhat spiral horns of the bucks, and the absence of lateral hoofs to the feet, and of glands on the face, as well as by the presence of a pair of glands, marked by black tufts, on the hind surface of the hind-feet. The does are hornless. The common species inhabits South and South-Eastern Africa, and is represented by a small race in Nyasaland; the second species (*E. petersi*, 1124) being from Angola. Pallas associate in herds, including from twenty to one hundred individuals, the majority of which are usually females. They are seldom found far away from water, and often frequent sandy plains covered with mimosas and low scrub near rivers. In speed they surpass all other African Antelopes, and their leaping powers are described as marvellous.

The Chiru Antelope.

Genus *Pantholops*.

The Tibetan Antelope, or Chiru, *Pantholops hodgsoni* (1144, fig. 24), is the sole member of a genus apparently nearly allied to the Saiga, but well distinguished by the long black horns of the bucks, and the less convex nose, in which the nostrils open anteriorly instead of downwards. Chiru are inhabitants of the desolate open plateau of Tibet, at elevations of between 13,000 and 18,000 feet above the sea-level. To withstand the intense winter cold of those districts, the body is covered with an extremely thick coat of soft fur, which assumes a woolly texture at the base. Generally Chiru are found in small parties, although they occasionally congregate in herds.

The Saiga Antelope.

Genus *Saiga*.

The Saiga Antelope, *Saiga tatarica* (1146, fig. 25), which alone represents the genus of the same name, is a desert-dwelling Antelope, easily recognised by its extraordinary swollen and puffy nose, in which the apertures of the tubular nostrils are directed downwards. The horns of the males are peculiar for their yellowish colour, and the wide distance they are set from one another on the head. There is a small gland on each side of the face below the eye; and the ears are remarkable for their short and rounded form. At the

present day the headquarters of this Antelope are the Kirghiz Steppes, but a century ago its range extended as far west as Poland. During the latter part of the Tertiary period the Saiga was much more widely distributed, its fossilised remains having been obtained from many parts of Western Europe, including Britain. Saigas associate in large herds; and although they run swiftly for a short distance, they soon tire, and are thus easily captured. The tubular nose, which can be shortened by being wrinkled up, may be a provision to prevent particles of sand being carried up into the nose-chamber. The specimens exhibited were presented by the Duke of Bedford.

**The Pigmy, or
Royal, Antelope.
Genus *Neotragus*.**

The genus *Neotragus*—of which the Pigmy or Royal Antelope, *Neotragus pygmaeus* (1154), is the typical representative, brings us to a group

[Case 56.] which includes a number of allied species arranged in the genera *Oreotragus*, *Oribia*, *Raphiceros*, *Nesotragus*, *Hylarnus*, and *Madoqua*. All these Neotragine Antelopes are of small size. They may have the muzzle short and naked, or elongated and hairy; but the gland below the eye is always large, and opens by a small circular orifice. The tail is either short or of medium length; and lateral hoofs may be present or absent. The horns—which are present only in the males—are short, and more or less nearly straight, with ridges at the base, but smooth at the tip; their direction being either vertical or inclining backwards. From the following genera, *Neotragus* differs by the very small size of the horns of the males, which do not reach within some distance of the back of the skull; and likewise by the absence of any vacuities between the bones of the face. Two allied species, one from West Africa and the other from the Ituri Forest, have been named *Hylarnus*.

**The Suni Antelopes.
Genus *Nesotragus*.**

The two East African species of this genus, the Suni, or Zanzibar Antelope, *Nesotragus moschatus* (1155), and *N. livingstonianus* (1156),

[Case 56.] are somewhat larger than the Pigmy Antelope, with relatively longer horns, which are inclined backwards nearly in the line of the face, and reach at least as far as the back of the skull. As in the Pigmy Antelope, there are lateral hoofs to the feet, but no bare glandular patches behind the ear. In addition to inhabiting the mainland, the Zanzibar Antelope is found on two small coral-

FIG. 25.



THE SAIGA ANTELOPE (*Saiga tatarica*).
(From a specimen presented by the Duke of Bedford, K.G.)

islands at the entrance to the harbour of Zanzibar, where it can obtain no water, except such rain or dew as may fall on the leaves, for many months. In these islands the Antelopes live entirely on leaves and twigs of trees and scrub, never touching the wiry grass with which parts are covered.

The Grysbok and the Steinbok. From the other members of the *Neotragina* [Case 56.] with naked muzzles and no glandular spot below the ear, the Grysbok, *Raphiceros melanotis* (1157), and the Steinbok, *R. campestris* (1158), are distinguished by the nearly vertical direction of the horns; while they are further characterised by the small size of the depression in the skull for the reception of the gland below the eye. The Grysbok possesses lateral hoofs, but these are absent in the Steinbok. The Steinbok is one of the most common Antelopes of South Africa, frequenting the open plains either singly or in pairs. It commences feeding about sundown, and continues its wanderings through the night, retiring to the cover afforded by a bush or patch of tall grass for repose during the day. These Antelopes run with great speed. There is more than one species of Steinbok.

The Oribi Antelopes. The species of Oribi, as typified by the South [Case 56.] African *Oribia oribi* (1160), differ from the other *Neotraginae* with pointed hoofs and naked muzzles by the presence of a bare glandular spot below each ear. As additional distinctive features, may be noticed the presence of lateral hoofs, and the large size of the depression in the skull for the gland below the eye. The horns are generally about three-quarters the length of the skull, and have a variable number of ridges at the base. Oribis are inhabitants of open country, and abundant in South and East Africa. Although absent from the West Coast and the Congo districts, they reappear in the open country of Gambia and Senegal, where they are represented by *O. nigricaudata* (1161). In the South African Oribi there are tufts of long hair on the knees, which are wanting in the Gambian species.

The Dik-dik Antelopes. The various East and North-East African [Case 56.] small Antelopes known as Dik-diks differ from the other members of the *Neotraginae* by their elongated and hairy noses, and likewise by the tuft of

FIG. 26.



HEAD OF THE REDBUCK
(*Cervicapra arundinum*).

(From specimens in the Museum.)

FIG. 27



HEAD OF THE LICHI KOB
(*Cobus leche*).

(To face page 43,

agrees in its comparatively small, straight, and upright horns, whereas in point of size and in several structural features it comes nearer to the latter. In the Rhebok the male only is furnished with horns; and there is no gland below the eye, although there are small lateral hoofs to the feet. Rhebok inhabit the hilly districts of South and South-East Africa, and much resemble Chamois in their general habits. They are usually found in parties numbering from six to twelve; but are now much less abundant than formerly.

Reedbucks. The South African Reedbuck or Reitbok, *Cervicapra* **Genus** *arundinum* (1214, fig. 26), is the typical representative **Cervicapra.** of the Cervicaprine section of Antelopes, or *Cervicaprinae*, which includes medium-sized, or large species, with naked muzzles, and narrow, goat-like upper molar teeth. On the face the glands below the eyes are either rudimentary or wanting, but the skull has frequently unossified spaces in this position, as well as pits on the forehead, and there may be glandular patches below the ears. From the other members of the group, Reedbucks, of which there are several species, are distinguished by their comparatively small and forwardly-curved horns, and the rather short and very bushy tail. They have also a bare glandular patch below the ear. The true Reedbuck, which ranges to the Bahr-el-Ghazal, generally associates in pairs, and was formerly abundant on open, grassy, or reedy valleys traversed by streams. Although never found far away from water, these Antelopes keep to dry ground when hunted, and do not seek protection by venturing into boggy localities.

[West
Corridor
Cases II
& III.]

The Waterbucks and Kobs. These Antelopes, the largest members of the Cervicaprine section, are water-loving animals, **Genus** *Cobus*. associating in small herds. Their long and sublyrate horns are ridged nearly throughout their length, and the tail is rather long, and tufted at the tip. Among the larger species are the Common Waterbuck, *C. ellipsiprymnus* (1218), of South Africa, distinguished by the white elliptical ring on the rump, the Sing-sing Waterbuck, *C. unctuosus*, of West Africa, and the closely allied Defassa Waterbuck, *C. defassa* (1219, fig. 28), of East Africa and Abyssinia. The smaller forms include Mrs. Gray's Kob, *C. maria* (1220, fig. 30), the nearly related White-eared Kob, *C. leucotis* (1221), of the White Nile, old males of both of which

[Cases III,
XIII, &
XIV.]

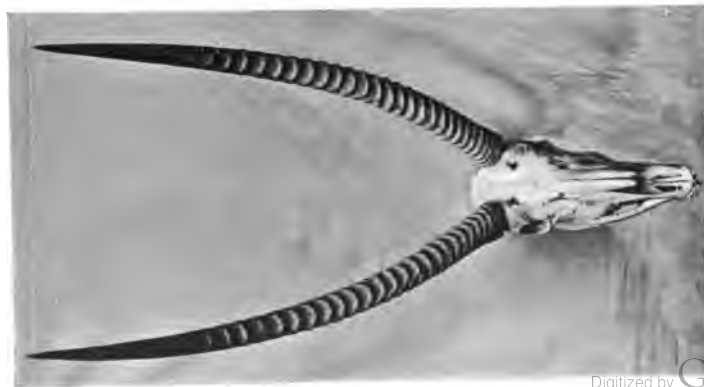
are blackish-brown, Vaughan's Kob, *C. vaughani* (1222), of the Southern Bahr-el-Ghazal, the West African Buffon's Kob, *C. cob* (1223), the Uganda Kob, *C. thomasi* (1224), the Puku Kob, *C. vardoni* (1225), distinguished by the absence of black on the legs, the Lichi or Lechwe, *C. leche* (1226, fig. 27), of South Central Africa, and the Black Lichi, *C. smithemani* (1227), of the Lake Mweru district. Both the latter have the hinder surface of the pasterns bare. Waterbuck are found in herds of twenty or more; in some districts they frequent steep stony hills seldom more than a mile from a river, to which they flee when pursued, but they often dwell among reeds on river-banks. The Lichi is a swamp-dwelling species, frequently standing up to its neck in water; even when deeply immersed, it never swims, but progresses by leaps.

The Duiker Antelopes. Together with the Indian Four-horned Antelope (*Tetraceros*), the African Duikers, as typified by the Cape Duiker-Bok, *Cephalophus*.

[Lower
Mammal
Gallery.
Case 57.]

lophus grimmii (1174), constitute a group of small or medium-sized Antelopes (*Cephalophinae*) presenting the following characteristics. They have the muzzle naked; large, more or less elongated, glandular openings below the eye; the tail of medium length; lateral hoofs present; but no tufts of hair on the knees. The horns are short and straight; and the upper molar teeth are broad and low-crowned. Duikers have a single pair of horns, which are generally present in both sexes, although smaller in the females than in the males, and are inclined backwards. The crown of the head bears a tuft of long hairs between the horns; and the openings of the gland below each eye form a long naked line on the side of the face above the muzzle. They attain their maximum development in West Africa, where some of the largest species occur. The typical South African species derives its name from the rapidity with which it dives into covert when disturbed. Most of the species go about in pairs. The smallest of all is the South African Blue Duiker, *C. monticola* (1175), and the largest the West African *C. sylvicultor* (1176), which is of the size of a small Donkey; next to this being the W. African *C. jentinki* (1177). Many of the smaller kinds, such as *C. abyssinicus* (1178), the banded *C. doriae* (1179) of West Africa, *C. dorsalis* (1180), *C. leucogaster* (1181), *C. natalensis* (1182), and *C. rufilatus* (1184), are exhibited.

FIG. 28.



SKULL AND HORNS OF THE DEFASSA
WATERBUCK (*Cobus defassa*).

FIG. 29.



SKULL AND HORNS OF JACKSON'S
HARTEBEEST (*Bubalis jacksoni*).

(From specimens in the Museum.)

FIG. 30.



SKULL AND HORNS OF MRS. GRAY'S KOB
(*Cobus maria*).

To face page 46.

FIG. 31.



HEAD OF COKE'S HARTEBEST
(*Bubalis cokei*).

(From specimens in the Museum.)

FIG. 32.



HEAD OF TIANG HARTEBEST
(*Damaliscus tiang*).

[To face page 45.]

The Four-horned Antelope. The one representative of this genus, *Tetraceros quadricornis* (1187, fig. 44), differs from the **Genus Tetraceros.** Duikers by the general presence of two pairs of horns in the male, and by the openings of the glands below the eyes forming a deep slit on each side of the muzzle. The females are without horns. The Four-horned Antelope, or Chousingha, as it is called in India, is generally found in pairs, and never associates in herds. Its favourite haunts are undulating or hilly districts, covered with thin forest or bush; but it avoids dense jungle. As it drinks daily, it never wanders far from the neighbourhood of water. Both when walking and running, it moves with a peculiar jerky action. This Antelope is somewhat locally distributed in India.

The Hartebeest & Bontebok Group. Together with the Gnus, or Wildebeests (*Connochates*), the Hartebeests (*Bubalis*) and their allies the Bontebok and Blesbok (*Damaliscus*) form a group, or subfamily (*Bubalinae*) of large-sized Antelopes presenting the following characteristics. The muzzle is naked, a small gland is present below each eye, the nostrils are large, the tail is long and tufted, and the lateral hoofs are relatively large. Horns of considerable size are present in both sexes, those of the female being rather more slender than those of the male; and the upper molar teeth are very tall and narrow. The true Hartebeests are distinguished from the other members by their abnormally long faces, and doubly-curved horns (fig. 29). On the other hand, in *Damaliscus* the face is shorter and the horns are more simply curved. Species of *Bubalis* range throughout Africa and Southern Arabia, whereas *Damaliscus* is restricted to Africa south of the Sahara. Hartebeests frequent open country, and many of them are very swift. Blesboks and Bonteboks were formerly found in herds of enormous size. A very large series of specimens of these Antelopes is exhibited; among those in the first-named genus being the Cape Hartebeest, *Bubalis caama* (1246), represented by a male presented by Sir Andrew Smith in 1842, the allied *B. jacksoni* (1247, fig. 29) of East Africa, Coke's Hartebeest, *B. cokei* (1243, fig. 31), the Tora Hartebeest, *B. tora* (1244), of East Africa, and its ally the Sig, or Swayne's Hartebeest, *B. swaynei* (1242), of Somaliland, and Lichtenstein's Hartebeest, *B. lichtensteini* (1240). In the second group are shown the Bastard Hartebeest, or Sassaby, *Damaliscus*

[West Corridor. Cases I, II, XV, XVI, XVII.]

lunatus (1238), of South Africa, the East African Hunter's Hartebeest, *D. hunteri* (1231), the East African Topi, *D. jimela* (1233), and Tiang, *D. tiang* (1232, fig. 32), and the South African Blesbok, *D. albifrons* (1234), and Bontebok, *D. pygargus* (1235), of which a beautiful group, presented by Mr. F. C. Selous, is exhibited.

The Gnu. The Gnus, or Wildebeests as they are called by the

Genus Cape Dutch, are distinguished, among other features, **Connocætes.** from the Hartebeests by the downwardly curving, smooth horns, and the very broad muzzle, which is fringed with long bristles, and has the apertures of the nostrils widely separated from one another. In young animals the horns are straight and upright; but in very old bulls they almost join one another at the base. The upright mane, and the thickly-haired long tail are also distinctive features. Gnus inhabit Central, East, and South Africa, and frequent open country in the neighbourhood of water. They possess great speed and endurance; and are remarkable for their habit of indulging in strange gambols and antics when a waggon or horseman approaches their feeding-grounds. The typical or true Gnu of the Hottentots is the South African White-tailed species, *Connocætes gnu* (1251, fig. 32, A), now nearly extinct, of which a male presented by Mr. F. C. Selous, and a female and calf, the gift of Mr. Rudd, are exhibited. The second species is the Brindled Gnu, *C. taurinus* (1252), of which there are several local races.

The Pronghorn Antelope.

The Pronghorn Antelope, or Prongbuck (*Antilocapra americana*, 1253, fig. 33),

Family Antilocapridæ. is the sole representative of a family closely allied to the *Bovidæ*, but distinguished by the circumstance that the sheaths of the horns of the males are branched and annually shed, instead of being simple and retained permanently. As a rule, the females are hornless; but when horns are present these are simple and much smaller than those of the bucks. Prongbucks are social animals; individuals of all ages and of both sexes congregating in large herds from September to February. They are the swiftest of North American Ungulates, although their endurance is not great. They differ from most Antelopes in being unable to leap. When running, the hairs of the white patch on the buttocks are erected and expanded so as to form a large chrysanthemum-like patch which forms a guide to the members of the herd in flight.

[East
Corridor.
Cases
XVIII,
XIX, &
XX.]

[Lower
Mammal
Gallery.
Cases 56
& 57.]

FIG. 32 A.



THE WHITE-TAILED GNU (*Connochætes gnu*) AND ITS SKULL.
(From specimens in the Museum.)

[To face page 46.]

FIG. 33.

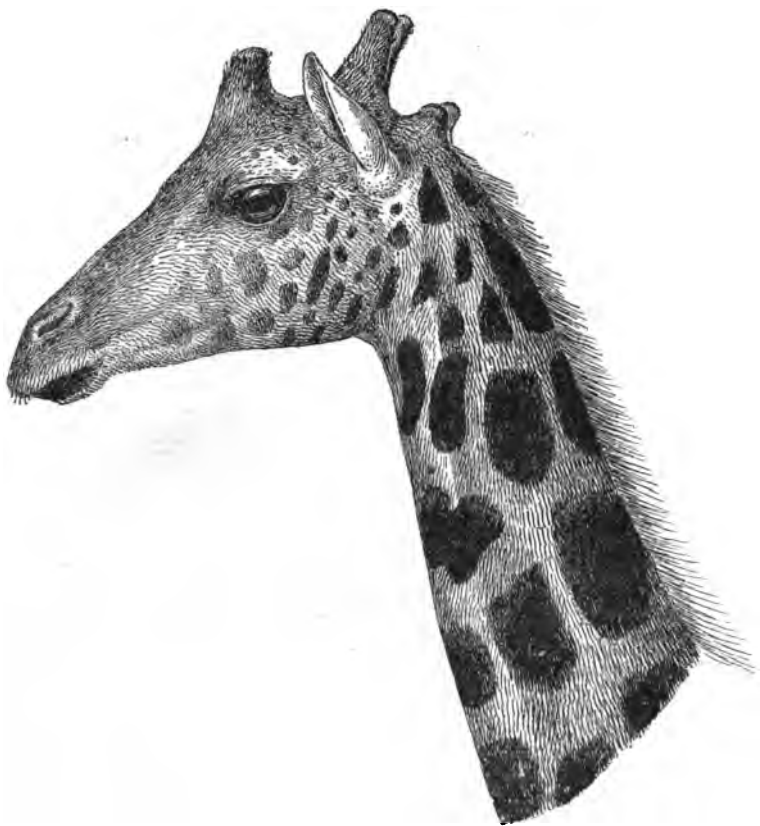
The Pronghorn Antelope or Prongbuck (*Antilocapra americana*).

Giraffes. The Giraffes and the Okapi of Africa are the sole living representatives of a family of Ruminants (*Giraffidæ*) distinguished by the double-lobed crowns of the outermost of the four pairs of lower front teeth (fig. 38, A), corresponding to the canines of carnivorous mammals. Their nearest affinities are with the Deer. Giraffes (*Giraffa*)—the tallest of all mammals—have a pair of conical horns covered with skin on the crown of the head, a shorter horn in the middle of the forehead, and in some cases a pair of rudimentary horns at the hinder extremity of the skull. The young have tufts of hair in place of the horns, and a dark patch of hair where the middle horn subsequently grows. Apart from the very distinct Somali Giraffe (*Giraffa reticulata*, 1254, fig. 35, A), characterised by its liver-red colour marked with a very coarse network of fine lines, there are numerous local forms of the ordinary Giraffe (*Giraffa camelopardalis*, 1255). The northern races, such as the Nubian *G. c. typica* and the Kordofan *G. c. antiquorum*, are characterised by the large frontal horn

[East
Corridor.
Cases
XXI to
XXIII.]

of the bulls, the white legs, the network type of coloration, and the pale tint. The latter feature is specially developed in the Nigerian *G. c. peralta*, which is also of the northern type. The

FIG. 34.



Head and neck of male Baringo Giraffe (*Giraffa camelopardalis rothschildi*) showing the five horns.

Baringo *G. c. rothschildi* (fig. 34) also has a large frontal horn and white legs, but the spots in the bulls are very dark, and those of the females jagged. In the Kilimanjaro *G. c. tippelskirchi* the frontal horn is often developed in the bulls, but the legs are frequently spotted to the fetlocks. Further south the frontal horn tends to disappear more or less completely, as in the Angola *G. c. angolensis*, the Transvaal *G. c. wardi*, and the Cape

FIG. 35.



A

B

A—HEAD AND NECK OF SOMALI GIRAFFE
(*Giraffa reticulata*).

B—HEAD AND NECK OF CAPE GIRAFFE
(*Giraffa camelopardalis capensis*).
(From specimens in the Museum.)

G. c. capensis (fig. 35, B), while the legs are fully spotted, and the colour-pattern on the body (especially on the last-named) is more of a blotched type, that is to say, consists of dark blotches on a fawn-ground, instead of a network of light lines on the ground. The Museum is indebted to the Duke of Bedford, the Hon. Walter Rothschild, Sir Harry Johnston, Major Powell-Cotton, Captain Gosling, Mr. Victor Buxton, and Mr. Rowland Ward for most of the exhibited specimens of Giraffes. The coloration of Giraffes harmonises so well with their surroundings that at a little distance these animals are invisible. Giraffes lived during the Tertiary period in India Persia, China, and Greece.

FIG. 36.

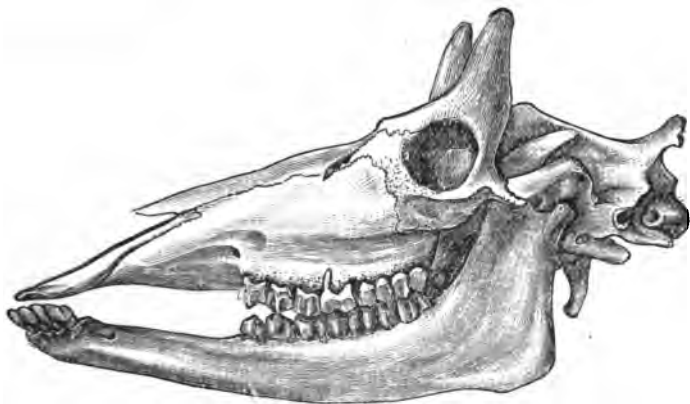
A Female Okapi (*Okapia johnstoni*).

The Okapi. The Okapi (*Okapia johnstoni*, 1258, fig. 36) re- [East
Corridor.
Case
XXI.]
Genus presents a genus in which the male has one pair of
Okapi. skin-covered horns with bare antler-like tips, while
the female is hornless. The neck and limbs are shorter than in
the Giraffes, and the type of coloration is different. These animals

E

are found in the depths of the Semliki, or Ituri, forest and its northward extension. Their nearest ally is the extinct *Samotherium* (1257), of the Tertiary rocks of Samos and Greece (fig. 37), the males of which are also furnished with a pair of simple horns. On the other hand, in the males of the extinct Indian *Sivatherium* (1258), *Bramatherium*, and *Hydaspitherium* (1259) the horns are branched; *Sivatherium* having in addition a pair of

FIG. 37.



Side View of the Skull of *Samotherium boissieri*, an extinct Ruminant from the Pliocene of Samos, nearly allied to the Okapi.

small simple horns low down on the forehead. Casts of the skulls of two of these gigantic Ruminants are exhibited in the East Corridor, alongside the Giraffe-case. *Helladotherium*, of the Tertiary of Greece, seems to have been hornless. The Okapi is represented in the Corridor by the two strips of skin sent home by Sir Harry Johnston, on the evidence of which the species "*Equus johnstoni*" was named, as well as by the complete skin of a female forwarded by the same gentleman from the Semliki Forest (fig. 36). The cast of a male skull is also shown.

[Lower
Mammal
Gallery.]

The Deer Tribe. The Deer or *Cervidæ* are distinguished from the other members of the Pecora (see page 13) by the appendages on the head, when present, taking the form of antlers; the nature of which is fully explained on page 2. Except in the Reindeer, these are present only in the males, and are always periodically shed. When antlers are wanting, the upper canines of the males are always long and tusk-like, as in the Musk-

Fig. 38.



A.
LOWER FRONT TEETH OF GIRAFFE (A) AND
ELK (B), to show the difference in the form
of the canine.

(From specimens in the Museum.)

Fig. 39.



ANTLERS OF THE EASTERN RED DEER
(*Cervus elaphus maral*).

[To face page 50.]

FIG. 40.



HEAD OF WOODLAND CARIBOU OR REINDEER
(*Rangifer tarandus caribou*).

FIG. 41.



HEAD OF THE ALASKAN ELK OR MOOSE
(*Alces machlis gigas*).

(From specimens in the Museum.)

Deer and Chinese Water-Deer; while in all cases the lower canines have simple crowns (fig. 38), and are thus unlike those of the *Giraffidæ*. Deer are mostly forest animals, and are distributed over all the world (exclusive of Australasia), with the remarkable exception of Africa south of the tropic of Cancer and Madagascar.

The Reindeer, or Caribou. The Reindeer, or Caribou, *Rangifer tarandus* (1260), inclusive of its many local phases, forms a Genus *Rangifer*. genus by itself, readily distinguished from all other Deer by the peculiar form of the antlers (fig. 40), and their presence in both sexes. Frequently—and more especially in American examples—one brow-tine of the antlers is much more developed than the other. In the feet the lateral pair of hoofs is unusually large, and the cleft between the main pair very deep; thus allowing the hoofs to spread out widely, and so to afford a firmer support on the yielding snow. In Scandinavia the Reindeer has long been domesticated; and not only serves the natives as a beast of burden and draught, but likewise supplies them with clothing, milk, and meat. Harnessed to a sleigh, it will draw a load of 300 lbs. a distance of 100 miles per day over the frozen snow. In summer the chief food of the Lapland Reindeer consists of a peculiar kind of moss and certain lichens which the animals search for by scraping away the snow with their feet. The wild Reindeer is a considerably larger animal than the domesticated breed. Young Reindeer are not spotted. The Scandinavian, or typical, Reindeer is represented by a male and female presented by Sir William and Mr. C. Ingram, and by a male of Osborn's Caribou (*R. tarandus osborni*) from the Yukon, and of the Newfoundland *R. t. terræ-novæ* presented by Mr. F. C. Selous, as well as by other specimens.

[Lower Mammal Gallery, Cases B & 58.]

The Elk, or Moose. In addition to being the largest of living Deer, Elk, or Moose, *Alces machlis*, or *A. alces* (1261), are distinguished from other members of the *Cervidæ* by the form of the antlers of the males (fig. 41). These arise as cylindrical beams projecting on each side at right angles to the middle line of the skull, which after a short distance divide in a fork-like manner. The lower prong of this fork may be either simple, or divided into two or three tines, with some flattening. In the East Siberian *A. m. bedfordiæ* (1262), as well as in some Scandinavian Elk, the posterior division of the main fork divides into three tines,

[Cases A & 60.]

with no distinct flattening. In the typical form of the Scandinavian or Common Elk (*A. machlis*), on the other hand, this branch expands into a broad palmation, with one large tine at the base, and a number of smaller snags on the free border. The palmation appears to be more marked in the North American race (*A. machlis americanus*) than in the typical Scandinavian Elk. The largest of all is the Alaskan race (*A. m. gigas*, 1262 A), which is said to stand seven feet in height, with a span of six feet across the antlers. A specimen presented by the Hon. W. Rothschild is shown. The great length of the legs gives an ungainly appearance to Elk. The muzzle is long and fleshy, with a triangular or T-shaped naked patch below the nostrils; and the males have a sac, known as the bell, hanging from the throat. From the shortness of their necks, Elk are unable to graze when standing on level ground; their food consists of young shoots and leaves of willow and birch and various water-plants. In North America during the winter one male and several females form a "Mooseyard" in the forest, which they keep open by trampling the snow. Although generally timid, the males become very bold during the breeding-season, when the females utter a loud call; and at such times they fight both with their antlers and their hoofs. The usual pace is a shambling trot, but when pressed Elk break into a gallop. The female gives birth to one or two young at a time, which are not spotted.

Typical Deer. In the typical Deer of the genus *Cervus*, in its wider sense, the antlers of the bucks are large and
Genus Cervus. arise at an acute angle from the forehead, while

[Lower
Mammal
Gallery.
Cases 61,
61*, 62,
C, D, E.]

they never divide in a regular forked manner. Very generally they are rounded, or slightly flattened, throughout their length, but in the Fallow Deer they are expanded and palmate. The majority of the species are confined to the Old World; the North American Wapiti being the only one found in the New World. In habits, the Deer of this genus are gregarious animals during the breeding-season, a herd of does and young bucks being headed by one old stag, who has obtained the leadership by driving off his rivals. Usually one fawn is produced at a birth, and this is carefully concealed by the hind in dense covert. All Deer have very regular times of feeding.

The collection of Deer of this and certain other genera has been greatly enriched by specimens presented by the Duke of Bedford.

Red Deer Group.***Cervus elaphus*, &c.**

In the typical group of the genus *Cervus* are included Deer of large size from Europe, North Africa, Asia, and North America. The long and branched antlers are nearly cylindrical, usually with at least five tines a side, including a brow and a bez. There is a light area, generally including the tail, on the rump, and the tail itself is short. The young are spotted, but in the adult the colour is mostly uniform, although traces of spotting may remain. The Red Deer of Europe, or rather of Sweden (*C. elaphus*, 1263), is the typical form, with the most complex antlers; in Eastern Europe and Persia it is represented by the variety *C. elaphus maral* (1264, fig. 39), in which the antlers are often less complex, and there is much black on the flanks. Other species are Thorold's Deer (*C. albirostris*, 1265) of Tibet, the Hangul (*C. cashmirianus*, 1266) of Kashmir, the Yarkand Stag (*C. yarcandensis*, 1267), and the Shou (*C. affinis*, 1268) of the Chumbi Valley and Bhutan, the latter characterised by the forward curvature of the five-tined antlers. Wapiti form a sub-group, characterised by the great size of the fourth tine of the antlers, and the circumstance that all the tines above this are in the same fore-and-aft plane, as well by the extreme shortness of the tail, the large size of the rump-patch, and the dark under-parts. The typical Wapiti (*C. canadensis*, 1269) inhabits Eastern North America, and is represented by a variety (*C. canadensis occidentalis*, 1270) on the west side of the continent. In Central Asia the group is represented by the Thian Shan Wapiti (*C. songaricus*, 1271) of the Thian Shan and Western Altai, the Siberian Wapiti (*C. asiaticus*, 1272), the Manchurian Wapiti (*C. xanthopygus*, 1273), in which the antlers depart somewhat from the typical Wapiti type, and the Turkestan Wapiti (*C. bactrianus*, 1274), all of which may be regarded as local races of *C. canadensis*.

Sika Deer. The Deer of the subgenus *Pseudaxis* are all of small or medium size, and inhabit Eastern Asia. Their antlers have only four tines (the bez-tine of the Red Deer group being wanting), the posterior of which is much smaller than the one in front of it. The coat is always spotted with white in summer, but in some species the spots disappear in winter, while in others they persist. The tail is longer than in the Red Deer group, and the light disc on the buttocks pure white, bordered

above and on the sides with black. The group includes the Japanese Deer (*C. sika*, 1275) and its larger variety the Manchurian Deer (*C. sika manchuricus*, 1276); the still larger Pekin Deer (*C. hortulorum*, 1277); and the Formosan Deer (*C. taëvanus*, 1278), which is not larger than the Japanese species, but retains, in accordance with its tropical habitat, the spots throughout the year. A specimen of a race of *C. sika* (1278 X) inhabiting the Liu-Kiu Islands is shown. The hairs of the white rump-patch are expanded under the influence of excitement to form a large white rosette. Most of the specimens were presented by the Duke of Bedford.

Fallow-Deer. The European Fallow-Deer (*Cervus dama*, 1279) and
Subgenus the Persian Fallow-Deer (*Cervus mesopotamicus*,
Dama. 1280) form a group or subgenus (*Dama*) of the genus

[Cases C,
and 60.]

Cervus, readily characterised by the spotted summer coat and the flattened and expanded (palmated) antlers of the bucks. Although the common species is now extensively kept in English parks, it appears to have been originally introduced from the countries bordering the Mediterranean, where it is still found locally in a wild state. The spots are present only in the summer coat, as is the case in all Deer of temperate climates, in which the spotting is to accord with the speckled shade thrown by trees when in leaf. In tropical spotted Deer, on the other hand, the spots are permanent. There is a park-breed of Fallow-Deer which has a uniform and very dark-coloured coat at all seasons. The Persian Fallow-Deer, which inhabits the mountains of Luristan, has antlers of a different type (fig. 42), and is also distinguished by certain details in colour.

Extinct The extinct Irish Deer, *Cervus giganteus* (1281), although
Irish commonly termed the Irish Elk, is a member of the genus
Deer. *Cervus*, as is shown by the antlers of the males, which rise at an oblique angle to the middle line of the forehead, instead of at right angles to the same, as in the Elk. By many naturalists it is believed to be allied to the Fallow-Deer, with which it is connected by an extinct species from the superficial deposits of Germany, known as *Cervus ruffi*, in which the antlers have a more upright direction. Although the best-preserved remains are obtained from Ireland, this splendid species is by no means confined to that island, but also occurs in England, as well as a large part of the

FIG. 42.



HEAD OF PERSIAN FALLOW-DEER
(*Cervus* [*Dama*] *mesopotamicus*).

(From specimens in the Museum.)

FIG. 43.



HEAD OF THE THAMIN, OR ELD'S DEER
(*Cervus* [*Rucervus*] *eldi*).

[To face page 54.

Continent. In Ireland the skeletons are found in a freshwater shell-marl situated at the bottom of the peat-bogs, and not in the peat itself.

The Sambar Group of Deer. In this Indo-Malay group are included the Sambar ^[Cases 60 & 61.] (*Cervus unicolor*, 1282) of India and Burma, with **Subgenus Rusa.** its numerous Malay varieties, several closely allied smaller forms from the Malay and Philippine Islands, and the Indian Chital. The antlers, which are frequently very rugose on the surface, are of a simpler type than those of the Red Deer group. They have a single brow-tine, above which the beam rises nearly straight for some distance, to terminate usually in a simple fork. In all, the neck is more or less maned, and the tail of moderate length. The coat may be spotted in summer. The Sambar is peculiar among the genus in having the young generally without spots; it is a massively-built species, standing from 48 to 50 inches in height, and most abundant in hilly districts. The Malay Sambar, *C. unicolor equinus* (1283), has more white on the legs and smaller antlers. The smaller *C. swinhoei* (1284) of Formosa, and *C. philippinus* (1285) and *C. nigricans* (1288) from the Philippines, are closely allied; but the Philippine *C. alfredi* (1287) is black with white spots. The Chital or Indian Spotted Deer, *C. axis* (1288), is also characterised by the chestnut coat being spotted at all ages and seasons; the antlers being of the Rusa type, and the tail rather long, while there is no distinct mane on the neck. The Spotted Deer—which is perhaps the most beautiful member of the family to which it belongs—is one of the most characteristic of Indian Mammals; its especial habitat being amongst bushes and trees in the neighbourhood of water, and in bamboo-jungle. It is found both in hilly ground, and on the plains; but never wanders far from its drinking places. The true Rusa of Java, *C. hippelaphus* (1289), is a smaller and longer-haired Deer than the true Sambar, from which it also differs by its more rufous (in place of blackish) colour, and by the shape of the antlers.

The Hog-Deer Group. The Indian Hog-Deer, *Cervus* [*Hyelaphus*] ^[Cases 60 & 61.] *porcinus* (1290), represents a group of small **Subgenus Hyelaphus.** species nearly allied to the last, but distinguished by certain differences in the under surface of the skull. The Bavian Deer, *C. kuhli* (1291), of the Bavian Islands, near Java, is an allied species.

The Barasingha Group. A third Indo-Malay group of the genus *Cervus* is represented by the Burmese **Subgenus Rucervus.** Thamin (*C. eldi*, 1292, fig. 43), the Indian

[Cases
61 & 62.]

Barasingha or Swamp-Deer (*C. duvauceli*, 1293), and *C. schomburgki* (1294) of Siam. Compared with the Rusa group, these Deer have the beam of the antlers more flattened and more curved, while the large brow-tine arises at an obtuse instead of an acute angle, and the beam divides into two branches, at least one of which is more or less subdivided. In all the three species the tail is short, and the neck maned. The Thamin inhabits swamps and grassy plains, where it associates in herds of from ten to fifty or more individuals. The colour of these Deer is reddish or brownish, without distinct spots; and the gland-tufts on the hind-limbs are but little developed, or absent.

The Muntjacs. The Muntjacs, as they are called in India, form **Genus Cervulus** a group of small Deer confined to China and the **or Muntjacus.** Indo-Malay countries. From the genus *Cervus*

[Case 61]

they are readily distinguished by the long pedicles supporting the short antlers of the bucks (fig. 45); these pedicles converge below, and are continued on the sides of the forehead as rib-like ridges. Hence the name of Rib-faced Deer, which is frequently applied to the Muntjacs. The males have long, scimitar-like upper tusks. Muntjacs are solitary creatures, frequenting hilly, forest-clad ground, where they pass most of their time in thick covert, only coming out to graze in the early morning and about sunset. They carry the head and neck low; and in running have an ungainly and somewhat Sheep-like action. In penetrating thick covert at speed, they are unrivalled. The name of Barking-Deer, which is frequently applied to the Indian species, is taken from its peculiar alarm-cry, which is somewhat like the bark of a fox. Specimens of several species such as the Indian *C. muntjac* (1295), and the Chinese *C. lachrymans* (1296), are exhibited, these being red in colour. Other species, like *C. crinifrons* (1297), are however purplish grey in colour, like the members of the next genus.

The Tufted Deer. The Tufted Deer from China and Tibet, such as **Genus** *Elaphodus nichianus* (1298) and *E. cephalophus* **Elaphodus.** (1299), comprise a few small species nearly allied to the Muntjacs, from which they may be distinguished by the pedicles supporting the very minute antlers of the males

FIG. 44.



SKULL OF THE FOUR-HORNED ANTELOPE
(*Tetracos quatiicornis*).
(From specimens in the Museum.)

FIG. 45.



SKULL OF THE MUNTJAC
(*Cervulus muntjac*).

[To face page 56.

converging above, and not being continued as ridges in front of the eyes. There are also marked differences in the form of the skull. These Deer derive their name from the tuft of long hairs crowning the head,—a character possessed also by some of the Muntjacs. In the males the upper tusks are very large, and in both sexes the hair is remarkably coarse. The Tufted Deer probably resemble the Muntjacs in habits. [Case 61.]

The Chinese Water-Deer. The Chinese Water-Deer (*H. inermis*, [Case 58.]
Genus Hydropotes 1300), the sole well-defined representative
or Hydrolaphus. of its genus, differs from typical Deer and Muntjacs in the structure of the bones of the feet; and in this respect agrees with Reindeer, Elk, Roedeer, and the American Deer. In the skeleton of the fore-foot (as shown in the mounted specimen) only the lower ends of the lateral metacarpal bones (metacarpals ii and v) are retained, whereas in *Cervulus*, *Elaphodus*, and *Cervus* the upper extremities of these bones remain. From all members of the family except the Musk-Deer, the Water-Deer is distinguished by the absence of antlers in both sexes; but the males are furnished with large scimitar-like tusks (fig. 46). The species differs from all other Deer in producing as many as five or six young at birth. These Deer are found in number among the reeds on the banks of the river Yang-tsi-kiang.

The Roedeer. The Roebuck, *Capreolus vulgaris*, or *Capreolus* [Case 61.]
Genus Capreolus. *capreolus* (1301), typifies a group of small Deer distinguished by the characters of the antlers of the bucks; which are relatively short, rough, and approximated at the base, and have no brow-tine, but divide at some distance from the head into two branches, the hinder of which usually forks again. There are no tusks in the upper jaw, and the tail is rudimentary. Roedeer generally associate in pairs, and are found chiefly in or near woods. Specimens of the Roebuck in its red summer and olive winter dress are exhibited in the British Saloon at the end of the Bird Gallery. In the Mammal Gallery are also shown examples of the large Siberian Roe, *C. pygargus* (1302), and the Manchurian Roe, *C. manchuricus* (1303).

Père David's Deer. In the absence of a brow-tine to the antlers and the simple fork formed by their first
Genus Elaphurus. division, Père David's Deer, *Elaphurus davi-* [Case 59.]
dianus (1304), the single representative of its genus, differs from

Cervus and resembles the American Deer, although distinguished from the latter by the lateral metacarpal bones being represented by the upper instead of the lower ends. The posterior branch of the first fork of the antlers forms a long straight tine directed backwards, but the front branch is again forked. In gait and general appearance this species is very different from all other Old World Deer. It is known in Europe from specimens kept in the Imperial Park, Pekin; its true habitat being unknown. The species is represented in the collection by the mounted skin of a stag and the head of a hind; both presented by the Duke of Bedford.

American Deer. All the groups of Deer peculiar to America Genus *Dorcelaphus*, resemble the Roebuck in the structure of the or *Odocoileus*, &c. bones of the fore-feet, and are characterised by

[Cases
58 & 59.]

the form of their antlers, which have no representative of the brow-tine of *Cervus*, but may give off an upright snag some distance above the base, after which they are regularly forked. Among the members of the present genus some, like the Mule-Deer, *Dorcelaphus hemionus* (1305), have the two tines of this fork again divided regularly, but in the White-tailed Deer, *D. americanus*, or *virginianus* (1306) and its immediate relatives, only the first is thus forked. When adult, the coat is uniformly coloured, but in some species the young are spotted. The Black-tailed Deer, *D. columbianus* (1307), of British Columbia is an allied species. In the sub-genus *Blastoceros*, in which the direction of the hair on part of the back is reversed, the Pampas or Guazuti Deer, *D. (B.) bezoarticus* (1308), has the antlers with points, and the forked hind-tine much more developed than the simple front-tine. The larger and more northern Guazu, or Marsh-Deer, *D. (B.) dichotomus* (1309), which is found in Uruguay and South Brazil, has the antlers heavier and more complex, both prongs of the main fork being strongly developed, and each subdividing. Generally the hind-prong is stouter than the front one. Whereas the Pampas-Deer is an inhabitant of open plains, the Marsh-Deer frequents swamps and lakes, where it wallows in the mud, or enters the water. The Pampas-Deer utters a kind of whistle when alarmed, and the bucks exhale a strong odour.

The Guemal Deer. The two species of Guemal, *Xenelaphus bisulcus* Genus *Xenelaphus*, (1310) and *X. antisiensis* (1311), are medium-sized Deer confined to the Cordillera of the Andes or *Hippocamelus*. characterised by the single fork, of which the



FIG.
46.

FIG.
47.

FIG.
48.

FIG. 46.—SKULL OF THE CHINESE WATER-DEER (*Hydropotes inermis*).

FIG. 47.—SKULL OF THE MUSK-DEER (*Moschus moschiferus*).

FIG. 48.—SKULL OF A CHEVROTAIN (*Tragulus javanicus*).

lower prong is the longer, formed by the antlers of the bucks. [Case 58.] There is a tuft of hair on the inner side of the tarsus, but none on the outer surface of the metatarsus. The fawns are uniformly coloured; and the two species are chiefly distinguished by a slight difference in the antlers, and by coloration.

The Brockets. The Brockets, of which there are about half a dozen species, are some of the smallest American Deer. They are confined to Central and South America. The antlers of the bucks are in the form of simple spikes; and in both sexes the hair on the middle line of the face radiates in all directions from two points, one situated on the crown of the head, and the other below the line of the eyes. The fawns are spotted; and upper canine teeth are present in some of the species. Brockets associate in pairs; the does producing a single fawn in December or January. The adults run with considerable speed for a short distance, but can be easily ridden down. The group is represented in the gallery by a mounted specimen of the Central American *M. sartorii* (1312) and by a skeleton of the South American *M. rufa* (1313). [Case 58.]

Pigmy Deer. The species of this genus, *Pudu pudu* (1314), of the [Case 58.]
Genus Pudu. Chilian Andes, is the smallest of the American Deer, and is nearly allied to the Brockets, from which it differs by a peculiarity in the structure of the ankle-joint. The antlers of the bucks are very small, and the tail is short. The specimen exhibited was presented by the Duke of Bedford.

The Musk-Deer. The Musk-Deer or Kustura, *Moschus moschiferus* [Case 58.]
Genus Moschus. (1316), of Central Asia, represents by itself a subfamily of Deer (*Moschinae*), distinguished by several marked anatomical characters from the *Cervinae*, which includes all the other Deer. Both males and females are without antlers; but the former have long scimitar-like tusks, projecting some distance below the lips (fig. 47). The hair is very coarse and brittle. The musk, from which the animal takes its name, is secreted in a sac-like gland on the under surface of the body of the male. It has a peculiar and very powerful odour, and is largely used in the manufacture of perfumes. In the Himalaya Musk-Deer are found at elevations of from 8,000 to 12,000 feet, in forest or brush-wood.

They are solitary creatures, more than two adults being seldom, if ever, seen together. They repose during the day in a "form," and feed in the morning and evening. In running, they progress by a series of bounds. The large size of the lateral hoofs renders these animals very sure-footed. The young are spotted, and usually but one is produced at a time. The range of the Musk-Deer extends from Kashmir to Siberia and North-Western China; the animal from the last locality has been described as a distinct species, *M. sifanicus*.

[Lower
Mammal
Gallery.
Cases
63, 64.]

The Camel-Group. The group of Tylopoda, or "Cushion-footed Ungulates," is now represented only by the South American Llamas (*Lama*), and the Old World Camels (*Camelus*), collectively forming the family *Camelidæ*. As a group, they are characterised by the tall crowns and crescentic columns of the molars, and the presence of upper incisor teeth, although only the outer pair of the latter remains in the adult. In the long limbs only the third and fourth toes of the typical series of five are developed; and these bear hoof-like nails in front, while the sole of the foot forms a soft cushion-like pad. In the skeleton of both fore and hind limbs a cannon-bone is formed, but its lower end is divided to terminate in two smooth surfaces for the articulation of the toe-bones. All the members of the group have very long necks; but the head is devoid of either horns or antlers. The stomach is divided into three compartments, of which the first two contain a number of honeycomb-like cells in their walls for the storage of water. In feeding, Camels and Llamas chew the cud, or ruminate, like the true Ruminants.

The Camels.
Genus *Camelus*.

The Camels of the Old World comprise two species, only one of which is now found in a truly wild state. They are characterised by their large size, clumsy build, short ears, long tail, and the presence of either one or two humps on the back. The Arabian Camel, *Camelus dromedarius* (1325), which has but one hump, is employed as a beast of burden in N. Africa, Arabia, and India, and has been lately introduced into Australia and parts of the United States. The two-humped Bactrian species, *C. bactrianus* (1326), has a more northern

distribution, being domesticated throughout a large portion of Turkestan and the neighbouring region, extending as far as the Crimea in the west, and to Lake Baikal and Pekin in the east. Some of the wild Camels found near Yarkand are probably derived from animals that originally escaped from captivity; but others found in the deserts of Central Asia appear to be truly wild. The Bactrian species is the heavier and more clumsily-built of the two, and has shorter legs and thicker hair, and is better adapted for traversing rocky ground. From the large loads they carry, and their capacity for going a long time without water, Camels are most valuable beasts of burden, although their disposition is surly, and their temper uncertain. Fossil species are found in the north of India and Algeria, as well as in Russia and Rumania.

The Llamas. Under the general title of Llamas may be included not only the South American domesti-

Genus Lama. cated animals properly so called, but likewise the wild Vicugna, *Lama vicugna* (1327), and the Guanaco, [Case 64.] *L. huanacus* (1328). They are much smaller and less bulky animals than the Camels, with longer ears, shorter and more bushy tails, and no hump on the back. The wild species associate in large herds; both inhabit the high Andes immediately below the snow-line, but the Guanaco ranges southwards on to the plains of Argentina and Patagonia. They are exceedingly vigilant and shy; and their only means of defence is by spitting. The domesticated kinds are the true Llama, *L. glama* (1329), and the Alpaca, *L. alpaca* (1330), both of which appear to be descended from the Guanaco. The Alpaca is kept in large flocks, which graze on the open uplands of the Andes of Southern Peru and Northern Bolivia, at elevations of from fourteen to sixteen thousand feet. It is smaller than the Llama, and valued for its wool, of which blankets and ponchos are made. On the other hand, the Llama is employed as a beast of burden. Specimens of the Llama are exhibited in the North Hall, with the other domesticated animals. Remains of extinct Llamas are abundant in the earlier Tertiary deposits of North, but not of South America; the group having immigrated comparatively recently into the latter country. The specimen of the Guanaco was presented by Dr. F. P. Moreno, when Director of the Museum at La Plata.

[Lower
Mammal
Gallery.
Case 64*.]

The Mouse-Deer or Chevrotains.

**Section TRAGULINA.
Family Tragulidæ.**

The Mouse-Deer or Chevrotains, *Tragulidæ*, form a small group of Asiatic and African Artiodactyle Ungulates, in some respects intermediate in structure between Pigs, Camels, and Deer, with the latter of which they are often confounded. From the Pigs (*Suina*) they differ by the absence of upper incisor teeth, and by the crescent-shaped (selenodont) structure of the cusps of the molar teeth. The upper canines of the males are well developed and scimitar-like (fig. 48); but those of the lower jaw form a continuous series with the incisors, which they resemble in shape. Each foot has four complete toes. In the skeleton the fibula, or smaller bone of the leg, is complete; and the two middle metacarpals and metatarsals are in most cases respectively united to form a cannon-bone. The skull carries neither horns nor antlers. Chevrotains ruminate their food like the Pecora, but their stomachs have only three compartments, in place of the four found in the latter. They have somewhat the habits of Hares, skulking in thick grass, from which they run with great speed when driven out. Several species of the true or Asiatic Chevrotains, such as the Indian *Tragulus meminna* (1331), are exhibited, as well as one of the African representative of the group, *Dorcattherium aquaticum* (1334), a species inhabiting the tropical forest-zone of the West and Central districts.

[Cases
65-67.]

**The Pig-like Group.
Section SUINA.**

The Hippopotamuses, the Peccaries of America, and the Pigs of the Old World form the most generalised section of existing Artiodactyle Ungulates, known as the *Suina*. Their molar teeth have tuberculated, or "bunodont," crowns; and the third and fourth metacarpal and metatarsal bones of the feet are either completely separate, or are not fully united to form cannon-bones. Extinct forms serve, however, to connect the *Suina* more or less closely with the Pecora.

[Cases
66 & 67.]

**The Hippopotamuses.
Family Hippopotamidæ.**

The Hippopotamuses—both the species of which are confined to Africa, and may be included in the genus *Hippopotamus*—are characterised by their massive form, the wide and squared muzzle, and the broad and short feet, which have four subequal toes,

bearing short, rounded hoofs, and all touching the ground. The large incisor and canine teeth grow continuously; the upper incisors curving outwards, and the lower projecting forwards, while the canines are very large, and those of the upper jaw directed downwards. In the common species, *H. amphibius* (1340), which till recently ranged over the greater part of Africa, there are two pairs of incisors in each jaw; but in the much smaller *H. liberiensis* (1341), of the West Coast, there is generally only one lower pair, although some specimens (like the one exhibited) have two teeth on one side and one on the other. In certain extinct species (as shown in a lower jaw exhibited) there were, however, three pairs of equal-sized incisors in each jaw.

Although Hippopotamuses are now restricted to Africa, the common species ranged during the Pleistocene period as far north as England, and a smaller kind existed in Madagascar. In the antecedent Pliocene epoch several kinds flourished in India and Burma, where they survived till the Pleistocene. The common species—of which the numbers and range are now greatly reduced—lives in herds of from twenty to forty in the neighbourhood of rivers, where it finds its food, which consists of grass and aquatic plants. It feeds chiefly by night; and in districts where it is much hunted, spends most of the day in the water. There it is thoroughly at home, not only diving and swimming with facility, but walking easily on the river-bed. The Liberian species is stated to be much less aquatic, and more like a Pig in its habits. The splendid mounted specimen of the ordinary Hippopotamus was presented by Mr. Rowland Ward, of Piccadilly.

The Peccarios. The Peccaries (*Dicotyles* or *Tayassu*) of America [Case 65.]
Family Dicotylidæ. differ from the Old World Pigs (*Suidæ*) in that the upper canine teeth are directed downwards and have sharp cutting-edges, in the reduction of the number of hind-toes to three, and in the complex structure of the stomach. Moreover, the upper ends of the metacarpal and metatarsal bones of the feet are respectively united. The total number of teeth is thirty-eight, there being only two pairs of upper incisors, and three pairs of premolars in each jaw.

Peccaries are inhabitants of forest districts, and produce only two young at a birth, which are not spotted or striped with white.

The Collared Peccary, *D. tajacu* (1342), is found singly, in pairs, or in small parties of eight to ten, and is quite harmless ; but the larger White-lipped Peccary, *D. labiatus* (1343), is generally met with in herds of from fifty to a hundred head, and is of a more savage disposition, its sharp tusks inflicting severe wounds. Both kinds are omnivorous, and do much harm to cultivated lands.

The Pigs.
Family Suidæ.

[Lower
Mammal
Gallery.
Cases 65
& 67.]

The Pigs or Swine of the Old World, constituting the family *Suidæ*, are characterised by the possession of a long mobile snout, terminating in an oval, flat, truncated, nearly naked disc, in which the nostrils are placed, and by the upward curvature of the tusks (canines) in the males, or in both sexes. The hoofs of the two middle toes have their adjacent surfaces flattened ; while the lateral toes do not touch the ground in walking. The tusks continue to grow throughout life, but the incisor teeth are rooted. The molar teeth have rectangular crowns, the tubercles on which never wear into the distinct trefoils characterising those of the Hippopotamus. The skull is distinguished by its great length, more or less nearly straight profile, and the high, backwardly-inclined occipital crest. Very frequently the young are striped ; and there are always many individuals in a litter.

Wild Pigs are omnivorous animals, feeding largely upon roots and tubers, which are turned up from the ground by the mobile snout. Consequently, they do much harm to agriculture, especially when they associate in large herds.

Typical Wild Swine. The Pigs belonging to the typical genus *Sus* have usually a total of forty-four teeth, their tusks being relatively smaller than in the

[Case 67.] **Wart-Hogs**, and being covered in part with enamel throughout their whole length, instead of only at the tip. The last molar in each jaw is relatively wide and of moderate length. As in the Wart-Hogs, the lower tusks wear against the sides of the upper ones. The genus includes three subgeneric groups, often ranked as separate genera. Firstly, *Sus* proper, which comprises the typical Wild Pigs, ranging over the greater part of Asia, and Africa north of the tropics. Secondly, the diminutive Pigmy

Hog (*Porcula*) of the Bhutan and Nepal Terai. Thirdly, the African Bush-Pigs, or River-Hogs (*Potamochoærus*). In the latter the anterior premolars are generally shed in the adult, and the molars are of a somewhat simpler type, while the skull has some strong rough ridges above the root of the upper tusk. In all, the young are striped. Most of the species go about in herds, or "sounders," of considerable size, each headed by an old boar. The lower tusks of the males are terrible weapons of offence, capable of ripping open a horse with one sweep. If the upper tusk be broken, the lower one continues to grow till it forms a circle, as shown by specimens in the North Hall.

Two magnificent specimens of the Wild Boar, *Sus scrofa* (1344)—one a complete skin from Russia, presented by Count J. Potocki, the other a head from Amurland, the gift of the Hon. Walter Rothschild—are exhibited in the gallery. A fine example of the Indian Wild Boar, *Sus cristatus* (1345)—a species taking its name from the crest of long bristles on the nape of the neck—is also shown. In the North Hall is placed an example of the last-named species bred in Windsor Forest, and presented by H.M. the King; it appears to have developed some of the characteristics of the European species. In the North Hall are also exhibited models, heads, and skulls of various domesticated breeds, the derivatives of the European Wild Boar, with perhaps in some cases a cross of Eastern blood.

In the Mammal Gallery is shown the common Malay Wild Boar, *Sus vittatus* (1346), as well as one of the long-snouted *S. barbatus* (1347) from Borneo, the gift of Dr. C. Hose.

The African Bush-Pigs are represented by the Red River-Hog, *Sus* [*Potamochoærus*] *porcus* (1348) of West Africa, and *S. chæropotamus nyasæ* (1349), one of the examples of the latter presented by Sir Harry Johnston.

The Pigmy Hog of North-eastern India, *Sus* [*Porcula*] *salvianus* (1350) is represented by a specimen collected by the original describer of the species, Mr. Brian Hodgson, sometime British Resident at the Court of Khatmandu.

Of the great black Forest-Hog, *Hylochoærus meinertzhageni* [Case 65.] (1351), of the forest-zone of Equatorial Africa, only a skull is at

present exhibited. This animal is allied to the Wart-Hog, but has the skull less specialised.

The Wart-Hogs. The African Wart-Hogs (*Phacochoerus*) take their name from the large wart-like lobes,

Genus *Phacochoerus*. projecting from the sides of the face, but are

[Case 65.] more particularly distinguished by the character of the dentition. In young animals there is a total of thirty-four teeth, of which one pair (canines) forms huge tusks, while there is one pair of upper, and three of lower incisors. Of cheek-teeth there are six upper, and five lower pairs; the first three upper and the first two lower being premolars, and the remaining three in both jaws molars. In very old animals only the tusks and last molars may remain. The tusks are large in both sexes; and the last molar is a long and complex tooth, formed of a number of closely-packed vertical columns. Unlike those of ordinary Wild Pigs, the young are uniformly coloured. There are two closely allied species or varieties of the genus; namely, the Northern *P. aethiops* (1352), represented by a skeleton, and the Southern *P. aethiopicus* (1353), of which a male and female, presented by Mr. F. C. Selous, are shown. In habits they resemble the majority of the Pig-family, although they frequently take up their abode in the deserted burrows of the Aard-Vark. When driven out from such strongholds, they rush with great ferocity upon the dogs and hunters. They usually associate in pairs or small family-parties.

The Babirusa. The Wild Boar, or Babirusa ("Pig-Deer"), of Celebes, *Babirusa alfurus* (1354), alone represents

Genus *Babirusa*. a genus distinguished by the extraordinary de-

[Case 65.] velopment of the tusks of the male. These teeth grow continuously, and are long, slender, curved, and devoid of enamel; those of the upper jaw curving upwards, and piercing the skin without entering the mouth. The number of teeth is thirty-four; there being only two pairs of upper incisors, and two of premolars in each jaw. The skin is very rough and almost entirely devoid of hair. A mounted specimen and several skulls are exhibited.

SUBORDER HYRACOIDEA.

The Hyraxes of Syria and Africa form a subordinal group of Ungulates of which the existing representatives have no right to be reckoned as "Great Game" animals, although in past times they were represented in Africa (which apparently formed the original home of the group) by species as large as Tapirs. The molar teeth, and likewise the feet, present certain resemblances to those of Rhinoceroses.

[Lower
Mammal
Gallery.
Case 35*.]

On the Continent they are commonly known as Damans, but in South Africa they are called Klip-Das (Rock-Badger),—a title corrupted by the English colonists into "Dassie."

FIG. 49.

The Syrian Hyrax (*Procavia syriaca*.)

All the species may be included in the family *Procaviidae*, and the genus *Procavia* (formerly called *Hyrax*). In general appearance they are very similar to Rodents, but their feet are of an Ungulate type; the fore-feet being four-toed, and the hind pair three-toed. With the exception of the inner one on the hind-foot, which has a long, curved claw, the toes are furnished with broad, short, hoof-like nails. The upper jaw has a single pair of long, triangular incisors which grow throughout life; and in the lower jaw there are two pairs of such teeth, which are rooted. There are no canines, and the cheek-teeth are of the general type of those of the Rhinoceroses. A few of the numerous species climb trees, but the majority are terrestrial and social animals, generally living in

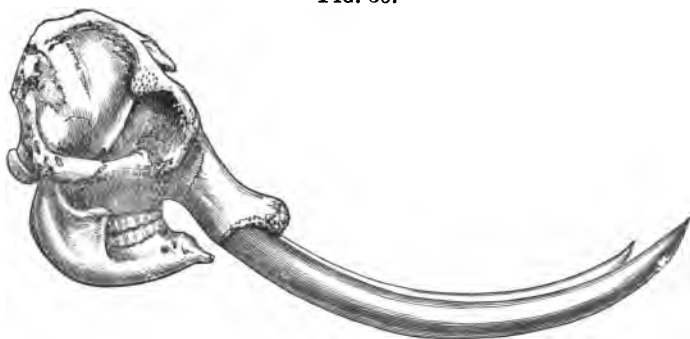
rocky or stony places, where they dwell either in holes beneath the rocks, or in the crevices between them. They feed chiefly on leaves and young twigs; and are usually only to be seen abroad in the early morning and in the evening. The Syrian species (fig. 49) is the animal called "Coney" (= Rabbit) in the English version of the Bible. Examples of several species are exhibited in the case (Nos. 983-990).

SUBORDER PROBOSCIDEA.

[Central
Hall and
Fossil
Mammal
Gallery.]

Since the great majority of the members of this, the last, subordinal group of Ungulates are extinct, it has been deemed advisable to exhibit the mounted specimens, skeletons, tusks, and teeth of its two existing representatives—the Asiatic Elephant (*Elephas maximus*) and the African Elephant (*E. africanus*)—in the neighbourhood of or alongside the remains of their fossil cousins and ancestors.

FIG. 50.



Skull of the African Elephant (*Elephas africanus*).

In modern Elephants the feet are short, broad and massive, and unlike those of any other existing Ungulates. They have, for instance, five toes, all encased in a common skin, with a flat truncated sole; externally the only indications of the toes are the broad oval nails, or hoofs, arranged in a semicircle round the front edge of the sole. The teeth comprise a pair of huge tusks, or incisors, in the upper jaw (fig. 50), which grow uninterrupted throughout life, and large transversely ridged molars (fig. 52), of which only one or two portions of two on each side of each jaw are in use at the same time; six pairs of these teeth being, however,

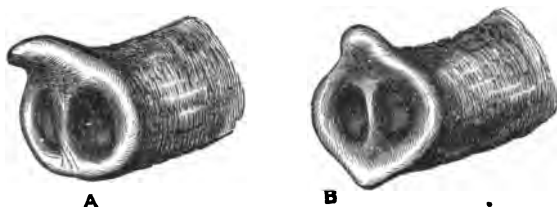
developed during the animal's life in both jaws. The most distinguishing external feature of the group is the extension of the upper lip and nose into the long, flexible and prehensile trunk or proboscis (fig. 51), at the tip of which are situated the nostrils.

The largest of all land Mammals, Elephants are exclusively vegetable-feeders, subsisting chiefly upon leaves and young branches of forest-trees, or upon both these and roots. Both liquid and solid food are conveyed to the mouth by means of the proboscis in the case of adults, although the young suck with their mouths.

For the past history of the Proboscidea the reader may be referred to the specimens in the Geological Department and the Guide devoted to their description.

The Asiatic or Indian Elephant, which ranges from India and Ceylon through Burma and the Malay Peninsula to Sumatra, is characterised by the relative flatness of the forehead, the comparatively small ears, and the regularly tapering and perfectly elastic trunk; the tail has two rows of bristles at the tip and a short distance above; and the trunk has one rather large finger-like process on the front edge of its extremity (fig. 51, A). The

FIG. 51.

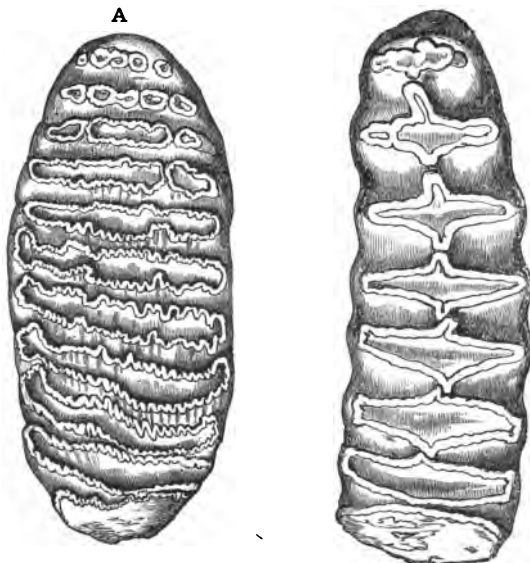


Tip of Trunk of the Asiatic (A) and the African Elephant (B).

hind-foot has four nails, whereas there are generally only three in the African species. Usually the females have very small tusks, which do not project beyond the jaw, and in some cases the same holds good with males, such tuskless males being termed Maknas. In Ceylon the indigenous race seems to have been tuskless. In the Malay countries the species is prone to partial albinism; specimens in which this feature is most developed constituting the sacred "white elephants" of Burma and Siam. The Indian Elephant feeds chiefly on grasses, sugar-cane, and leaves. Being extremely impatient of the sun's rays, in the hot weather it passes the day

in the densest jungle. Elephants usually go about in herds numbering from 30 to 50 individuals, but the older bulls frequently dwell alone for a time. Others—known as “rogues”—are permanently solitary. Of this species a stuffed specimen is placed in the Fossil Mammal Gallery; it belongs to the race in which the tusks are not fully developed. When alive, this Elephant was brought from India by H.M. the King when Prince of Wales, and it lived for many years in the Zoological Society's Gardens in the Regent's Park. The Mammoth was closely allied to the Indian species, from which it differed by the greater curvature of the tusks, and the coat of woolly, reddish hair, interspersed with bristles. Remnants of this woolly covering have been detected in the living species; and in new-born calves, as shown by a specimen in the Fossil Mammal Gallery, it is strongly developed.

FIG. 52.



An Upper Molar of the Asiatic (A), and of the African Elephant (B).

Among several skulls exhibited, the finest is one belonging to an elephant shot by Mr. G. P. Sanderson, in the Garo Hills, Assam, in 1888. Two tusks bequeathed by Lt.-Colonel G. M. Payne respectively weigh 77 and 73 lbs.

In the African Elephant (*Elephas africanus*) the molar teeth have fewer and wider plates of dentine and enamel, which in the worn condition form lozenge-shaped surfaces (fig. 52, B), with the borders of enamel much less crimped, or frilled, than in the Asiatic species. Externally, the African Elephant is distinguished by its huge ears, the very convex forehead, and the presence of two small finger-like processes on the tip of the trunk (fig. 51, B), while the trunk itself is less regularly tapering and elastic, looking as though composed of a number of distinct segments, comparable to the joints of a telescope. Tusks are generally present in both sexes, and frequently attain very large dimensions. This species often grows to ten feet in height, and may reach eleven or more. It feeds almost entirely on twigs, leaves and roots, throwing down trees for the purpose of obtaining the latter, and also digging for these with its tusks. Although equally fond of water, it is far less impatient of heat than its Indian cousin, and may frequently be seen basking in the sun. Like the latter, this species associates in herds.

The African Elephant formerly inhabited the whole of Africa south of the Sahara, but is now driven back towards the centre of the continent; its fossil remains have also been found in North Africa and Southern Europe. It is more courageous and more ill-tempered than its Indian ally, and therefore more difficult to tame; none of the present African natives have attempted its domestication. Owing to the value of its ivory it is continually hunted; and it is to be feared that the species will eventually become extinct.

The species is represented in the collection by a magnificent mounted male from near Fort Manning, South Nyasaland, or British Central Africa (see Frontispiece*), standing 11 feet 4 inches at the shoulder; and also by a mounted head from Lake Rudolf, presented by Mr. H. S. H. Cavendish. Among several specimens of skulls and tusks, one tusk is remarkable for its huge size, measuring 10 feet 2 inches in length, and $24\frac{1}{4}$ inches in maximum girth, and weighing 228 lbs.

Considerable differences, both as regards external form and the

* In taking this photograph it was found impossible to get the whole animal in focus, so that the head, tusks, and trunk appear abnormally large.

characters of the skull, are noticeable in Elephants from different parts of Africa. The most easily recognised points of distinction are the size and shape of the ears.

I. In the South African Elephant (*Elephas africanus capensis*) the ears are enormous (4 feet 5 inches by 4 feet in a female 8 feet 8 inches high), somewhat square in shape, with rounded corners, and a small, sharply pointed angular lappet in front. The forehead falls away towards the temples, so as to appear highly arched.

II. The West African Elephant (*E. africanus cyclotis*), typically from South Cameruns, also has the ears very large, but of quite different shape, the contour being oval, and the lappet in the form of a half-ellipse. The skin has a mosaic-like appearance, and its colour is a paler grey than in the third race.

III. In the Sudan Elephant (*E. africanus oxyotis*) the ears are considerably smaller, and semicircular in shape, with the front lappet very sharply pointed and angular.

IV. The East African Elephant (*E. africanus knockenhaueri*), typically from German East Africa, has still smaller ears, which are triangular in shape, with the front lappet angulated and pointed. The exhibited specimen (whose ears measure 4 feet $2\frac{1}{2}$ inches by 3 feet 5 inches) appears to come nearest to this race.

In addition to the above, there is a dwarf race of Elephant from the Congo (*E. africanus pumilio*), whose height may not have exceeded 7 feet. The Albert Nyanza Elephant has also been separated as a distinct race, under the name of *E. africanus albertensis*, characterised by certain peculiarities in the form of the skull, which is unusually short and broad.

LIST OF The Best Specimens of Horns, Antlers, and Tusks in the Collection of the Museum.

[The length of specimens is measured along the front curve; the girth is the maximum basal circumference; tip to tip measurement is the direct line between the tips.]

A.—RHINOCEROS HORNS.

	No.	Length. in.	Girth. in.
Rhinoceros unicornis. Indian Rhinoceros	79.11.21.47	13	18 $\frac{3}{4}$
<i>Transferred from the India Museum, 1879.</i>			
Rhinoceros sondaicus. Javan Rhinoceros	76.3.30.1	10 $\frac{5}{8}$	19 $\frac{5}{8}$
<i>Purchased from E. Gerrard, 1876.</i>			
Rhinoceros sumatrensis. Sumatran Rhinoceros	54.12.11.1	(front horn) 32 $\frac{1}{8}$	17 $\frac{3}{8}$
<i>Presented by Mr. Edward Cross, 1854.</i>			
Rhinoceros bicornis. Common or Black African Rhinoceros ..	38.6.9.101	(front horn) 21 $\frac{3}{8}$ (back horn) 19	22 21 $\frac{1}{2}$
<i>Collected by Sir Andrew Smith, 1838.</i>			
Rhinoceros simus. White or Square-nouthed Rhinoceros	1167 b	(front horn) 56 $\frac{1}{2}$	23 $\frac{1}{2}$
<i>No history.</i>			

List of Horns, Antlers, and Tusks.

B.—HOLLOW-HORNED RUMINANT HORNS.

	No.	Length. in.	Girth. in.	Tip to tip. in.
Bos ægyptiacus. Ankole Cow <i>Presented by Lt.-Col. C. Delmé-Radcliffe, 1901.</i>	O. 29	41½	14¾	54
Bos taurus. Cape Trek-Ox <i>Presented by S. African Cold Storage Co., 1901.</i>	O. 4	33	12	59¾
Bos indicus. Galla Ox <i>Purchased from H. Salt, Esq., 1852.</i>	52.12.15.9	47	15½	21½
Bos gaurus. Gaur. <i>Presented by A. O. Hume, Esq., C.B., 1891.</i>	91.8.7.209	25½	18	33
Bos frontalis. Gayal. <i>Purchased from E. Gerrard, 1896.</i>	96.6.20.1	17¼	17	41
Bos sondaicus. Banting <i>Presented by H. B. Low, Esq., 1800.</i>	80.5.4.3	21¾	12¼	13½
Bos sondaicus birmanicus. Tsaine or Burmese Banting <i>Presented by R. MacD. Hawker, Esq., 1900.</i>	0.9.11.1	27	14½	20¼
Bos (Pöephagus) grunniens. Yak <i>Presented by A. O. Hume, Esq., C.B., 1891.</i>	91.8.7.219	38¼	17	19
Bos (Bison) bonasus. European Bison <i>Presented by H.I.M. The Czar of Russia, 1845.</i>	45.10.13.1	18¼	12½	13¾
Bos (Bison) bison. American Bison <i>Dr. J. J. Audubon.</i>	851 a	12	13	17½

Bos (Bubalus) caffer. Cape Buffalo.....	52.2.15.10	45 $\frac{1}{4}$	41 $\frac{1}{4}$	37 $\frac{1}{2}$
<i>Purchased, 1852.</i>		$\left. \begin{array}{l} \text{Greatest out-} \\ \text{side width.} \end{array} \right\}$		
Bos (Bubalus) aequinoctialis. Abyssinian Buffalo	74.11.2.3	31 $\frac{3}{8}$	26 $\frac{3}{8}$	24 $\frac{3}{8}$
<i>Purchased from Gerrard, 1874.</i>		$\left. \begin{array}{l} \text{Greatest in-} \\ \text{side width.} \end{array} \right\}$		
Bos (Bubalus) nanus. Congo Buffalo	606 a	21 $\frac{1}{8}$	12 $\frac{3}{4}$	2 $\frac{1}{4}$
<i>Presented by the Royal Society.</i>				
Bos (Bubalus) bubalis. Indian Buffalo	604 d	77 $\frac{3}{8}$	17 $\frac{7}{8}$	—
<i>Sir Hans Sloane Collection.</i>				
Bos (Bubalus) depressicornis. Anoa	58.5.4.5	12 $\frac{3}{8}$	6	6 $\frac{1}{2}$
<i>Presented by the Zoological Society, 1858.</i>				
Ovis ammon. Siberian Argali	96.10.14.1	56	18 $\frac{1}{2}$	35
<i>Presented by St. George Littledale, Esq., 1896.</i>				
Ovis hodgsoni. Tibetan Argali	91.8.7.187	42 $\frac{1}{8}$	16 $\frac{3}{4}$	14 $\frac{1}{4}$
<i>Presented by A. O. Hume, Esq., C.B., 1891.</i>				
Ovis poli. Marco Polo's Sheep.....	91.8.7.181	66	15 $\frac{1}{4}$	44
<i>Presented by A. O. Hume, Esq., C.B., 1891.</i>				
Ovis littledalei. Littledale's Sheep	2.3.9.7	61 $\frac{1}{2}$	19 $\frac{1}{4}$	39 $\frac{1}{4}$
<i>Presented by St. George Littledale, Esq., 1902.</i>				
Ovis vignei. Shapo	91.8.7.180	29	12	18 $\frac{1}{2}$
<i>Presented by A. O. Hume, Esq., C.B., 1891.</i>				
Ovis vignei blanfordi. Baluchi Urial	86.10.15.21	35 $\frac{1}{2}$	10 $\frac{1}{2}$	16
<i>Collected by Dr. J. Atchison, 1886.</i>				
Ovis gmelini. Armenian Wild Sheep	54.1.34.1	40 $\frac{1}{4}$	10 $\frac{1}{2}$	5 $\frac{1}{2}$
<i>Presented by W. B. Barker, Esq., 1854.</i>				

List of Horns, Antlers, and Tusks.

HOLLOW-HORNED RUMINANT HORNS (continued).

	No.	Length. in.	Girth. in.	Tip to tip. in.
Ovis ophiön. Cyprian Mouflon	85.3.2.1	23	7	5 $\frac{3}{4}$
<i>Presented by Gen. Sir R. Biddulph, 1885.</i>				
Ovis musimon. Corsican Mouflon	53.8.29.19	27	8 $\frac{1}{2}$	10
<i>Presented by the Zoological Society, 1853.</i>				
Ovis canadensis. Bighorn Sheep	52.9.18.16	40 $\frac{3}{4}$	16 $\frac{1}{2}$	—
<i>Presented by the Zoological Society, 1852.</i>				
Ovis dalli. White Bighorn	99.2.24.1	32 $\frac{1}{2}$	13 $\frac{1}{4}$	20 $\frac{1}{2}$
<i>Presented by J. T. Studley, Esq., 1899.</i>				
Ovis stonei. Black Bighorn	5.11.23.1	36 $\frac{3}{4}$	12 $\frac{1}{2}$	21 $\frac{1}{4}$
<i>Presented by D. T. Hanbury, Esq., 1905.</i>				
Ovis lervia. Udad, or Barbary Sheep	96.12.15.1	28 $\frac{1}{2}$	11 $\frac{1}{2}$	18
<i>Presented by the Hon. John Ward, 1896.</i>				
Ovis nahura. Bharal, or Blue Sheep	91.8.7.200	28	11	20 $\frac{1}{4}$
<i>Presented by A. O. Hume, Esq., C.B., 1901.</i>				
Capra cylindricornis. Pallas's Ture	79.11.15.1	33 $\frac{3}{8}$	12	19 $\frac{3}{4}$
<i>By exchange with the Warsaw Museum, 1879.</i>				
Capra caucasica. West Caucasian Ture	92.3.16.1	34 $\frac{1}{4}$	11	16
<i>Presented by St. George Littledale, Esq., 1892.</i>				
Capra pyrenaica. Spanish Ibex	48.2.5.4	28	9 $\frac{1}{2}$	23 $\frac{3}{8}$
<i>Purchased, 1848.</i>				

Capra hircus tegagrus. Wild Goat <i>No history.</i>	653 <i>y</i>	48½	8½	13½
Capra hircus blythi. Sind Wild Goat <i>Presented by A. O. Hume, Esq., C.B., 1891.</i>	91.8.7.161	44½	8½	11
Capra nubiana. Nubian Ibex <i>Presented by J. Burton, Esq.</i>	651 <i>b</i>	46½	8	—
Capra vali. Abyssinian Ibex <i>Purchased from Major Powell Cotton, 1900.</i>	0.6.18.1	43½	11½	27
Capra ibex. Alpine Ibex <i>No history.</i>	650 <i>a</i>	43	10½	35½
Capra sibirica. Kuldja Race of Siberian Ibex <i>Presented by St. George Littledale, Esq., 1902.</i>	2.3.9.4	50½	11½	35½
Capra falconeri. Markhor <i>Transferred from India Museum (Dr. H. Falconer), 1879.</i>	782.6	46½	11½	—
Capra falconeri jerdoni. Suleiman Markhor <i>Presented by Lt.-Col. Grant.</i>	79.6.21.1	48½	7½	—
Hemitragus jemlaicus. Tahr <i>Presented by A. O. Hume, Esq., C.B., 1891.</i>	91.8.7.126	13¾	9	11½
Hemitragus hylocrius. Nilgiri Tahr, or Ibex <i>Presented by E. Partridge, Esq.</i>	654 <i>a</i>	14½	8¾	6½
Ovibos moschatus. Musk-Ox <i>Presented by Dr. J. Rae, 1853.</i>	53.9.20.1	26¾	12½	—
Budorcas taxicolor. Takin <i>Purchased from C. F. Rowe, Esq., 1881.</i>	81.6.20.12	22½	10½	14¾

List of Horns, Antlers, and Tusks.

HOLLOW-HORNED RUMINANT HORNS (continued).

	No.	Length. in.	Girth. in.	Tip to tip. in.
Haploceros montanus. Rocky Mountain Goat <i>J. Bate, Esq.</i>	87.3.24.1	9½	5¼	6
Nemorhædus sumatrensis. Sumatran Serow <i>Presented by A. O. Hume, Esq., C.B., 1891.</i>	91.8.7.97	9	5	2
Nemorhædus bubalinus. Himalayan Serow <i>Presented by R. Lydekker, Esq., 1888.</i>	88.3.20.6	9¾	5½	6
Rupicapra tragus. Chamois <i>Presented by C. G. Danford, Esq., 1886.</i>	86.12.27.1	9¾	3¼	3⅞
Taurotragus derbianus. Derbian Eland <i>Presented by the Earl of Derby, 1846.</i>	1648 a	32½	12½	29⅞
Taurotragus oryx. Eland <i>Purchased from F. C. Selous, Esq., 1881.</i>	81.10.28.7	31½	12¾	12½
Bœocercus euryceros. Bongo <i>Presented by the Zoological Society, 1858.</i>	58.5.4.7	31	11	11
Strepsiceros kudu. Kudu <i>Presented by Sir H. H. Johnston, K.C.B., 1893.</i>	93.7.9.25	52	11	29¾
Strepsiceros imberbis. Lesser Kudu <i>Presented by R. MacD. Hawker, Esq., 1896.</i>	96.6.9.19	34	6¾	11
Tragelaphus spekei. Situtunga, or Nakong <i>Purchased from F. C. Selous, Esq., 1881.</i>	81.10.28.8	31½	7	16½

Tragelaphus gratus. West African Situtunga <i>Purchased from E. Gerrard, 1882.</i>	23 $\frac{3}{4}$	82.7.24.11	5 $\frac{1}{2}$	5 $\frac{1}{2}$
Tragelaphus angasi. Nyala <i>Purchased, 1850.</i>	28	50.8.30.1	8 $\frac{1}{8}$	10 $\frac{1}{8}$
Tragelaphus scriptus. Bushbuck <i>Purchased from Morton Green, Esq., 1889.</i>	17	89.2.4.3	7 $\frac{1}{2}$	5 $\frac{1}{2}$
Boselaphus tragocamelus. Nilgai <i>Presented by A. O. Hume, Esq., C.B., 1891.</i>	9 $\frac{1}{4}$	91.8.7.51	6 $\frac{3}{4}$	4 $\frac{7}{8}$
Hippotragus niger. Sable Antelope <i>Purchased from F. C. Selous, Esq., 1883.</i>	43	83.7.28.3	9 $\frac{3}{4}$	6 $\frac{1}{2}$
Hippotragus equinus. Roan Antelope <i>Purchased from E. Gerrard.</i>	24	636 h	8 $\frac{3}{4}$	8
Oryx gazella. Gemsbuck <i>Purchased from F. C. Selous, Esq., 1881.</i>	43 $\frac{1}{4}$	81.7.27.1	6 $\frac{1}{2}$	18 $\frac{1}{2}$
Oryx beisa. Beisa Oryx <i>Presented by W. F. Sinclair, Esq., 1891.</i>	35 $\frac{3}{4}$	91.7.20.1	6 $\frac{1}{2}$	9 $\frac{1}{2}$
Oryx leucoryx. Arabian Oryx <i>Presented by B. T. Ffinch, Esq., 1890.</i>	15	90.12.20.1	3 $\frac{3}{8}$	4 $\frac{1}{2}$
Oryx algal. Scimitar Oryx <i>Presented by Capt. H. N. Dunn, 1903.</i>	39 $\frac{3}{4}$	3.2.8.39	6 $\frac{1}{4}$	4 $\frac{1}{2}$
Addax masomaculatus. Addax <i>Presented by J. I. S. Whitaker, Esq., 1899.</i>	38 $\frac{1}{2}$	99.1.2.1	6 $\frac{1}{2}$	12 $\frac{1}{2}$
Antelope cervicapra. Blackbuck <i>Presented by A. O. Hume, Esq., C.B., 1891.</i>	25 $\frac{3}{8}$	91.8.7.81	5 $\frac{1}{2}$	14 $\frac{1}{2}$

List of Horns, Antlers, and Tusks.

HOLLOW-HORNED RUMINANT HORNS (continued).

	No.	Length. in.	Girth. in.	Tip to tip. in.
<i>Epyceros melampus</i> . Palla .. <i>Presented by Dr. Burchell.</i>	619 a	27½	5¼	14½
<i>Saiga tatarica</i> . Saiga..... <i>Bremen Geographical Society (per Dr. O. Finsch), 1878.</i>	78.12.21.26	13½	5	5½
<i>Pantholops hodgsoni</i> . Chiru .. <i>Presented by A. O. Hume, Esq., C.B., 1891.</i>	91.8.7.64	25¾	5½	12½
<i>Antidorcas euchores</i> . Springbuck .. <i>Purchased from Argent, 1846.</i>	46.10.24.2	14	5¾	4½
<i>Gazella picticaudata</i> . Tibetan Gazelle .. <i>Presented by A. O. Hume, Esq., C.B., 1891.</i>		13½	3¾	5½
<i>Gazella przewalskii</i> . Przewalski's Gazelle .. <i>By exchange with St. Petersburg Museum, 1897.</i>	97.2.26.14	10½	4¾	2¾
<i>Gazella gutturosa</i> . Mongolian Gazelle .. <i>Bremen Geographical Society (per Dr. O. Finsch), 1878.</i>	78.12.21.26	13¾	4½	6
<i>Gazella subgutturosa</i> . Goibred Gazelle .. <i>Presented by A. O. Hume, Esq., C.B., 1891.</i>	91.8.7.91	12¾	4¾	5½
<i>Gazella dorcas</i> . Dorcas Gazelle .. <i>Presented by Rowland Ward, Esq., 1892.</i>	92.3.19.2	13¾	3¾	—
<i>Gazella cuvieri</i> . Cuvier's Gazelle .. <i>Presented by Rowland Ward, Esq., 1894.</i>	94.4.18.13	13¾	4	4

Gazella arabica. Arabian Gazelle <i>Presented by W. T. Blanford, Esq., 1867.</i>	69.10.24.100	8½	4	2
Gazella bennetti. Indian Gazelle <i>Presented by Lt.-Col. J. Evans, 1889.</i>	89.11.20.13	12¾	4	5½
Gazella leptoceros. Loder's Gazelle <i>Presented by Sir E. G. Loder, Bart., 1894.</i>	94.6.4.3	13½	3½	10
Gazella isabella. Isabelline Gazelle <i>Presented by W. T. Blanford, Esq., 1869.</i>	69.10.24.2	10½	3¾	4
Gazella tilonura. Muscat Gazelle <i>Purchased from E. Gerrard, 1873.</i>	73.2.24.8	10¾	4	2½
Gazella rufifrons. Red-fronted Gazelle <i>Purchased, 1846.</i>	46.11.23.8	6¼	2½	2¾
Gazella thomsoni. Thomson's Gazelle <i>Presented by F. J. Jackson, Esq., C.B., 1891.</i>	91.1.6.2	15¼	4¾	4½
Gazella granti. Grant's Gazelle <i>Bequeathed by H. Andrew, Esq., 1904.</i>	4.7.2.7	26	7	11¾
Gazella petersi. Peters's Gazelle <i>Presented by F. J. Jackson, Esq., C.B., 1892.</i>	92.10.10.16	22½	6¾	5½
Gazella sømmerringi. Sømmerring's Gazelle <i>Presented by Lt.-Gen. Sir A. Paget, 1891.</i>	91.12.3.3	16	5	3¼
Gazella ruficollis. Red-necked Gazelle <i>Purchased from Parreys.</i>	1742 a	12¼	4	5½

List of Horns, Antlers, and Tusks.

HOLLOW-HORNED RUMINANT HORNS (continued).

	No.	Length. in.	Girth. in.	Tip to tip. in.
Gazella mhorr. Mhor Gazelle..... <i>Presented by W. Willshire, Esq., 1855.</i>	55.12.24.279	11 $\frac{3}{4}$	6	3 $\frac{3}{4}$
Ammodorcas clarkiei. Dibatag..... <i>Presented by T. W. H. Clarke, Esq., 1891.</i>	91.12.19.8	9 $\frac{3}{4}$	4 $\frac{1}{2}$	5 $\frac{1}{8}$
Lithocranius walleri. Gerenuk..... <i>Purchased from Mr. J. Menges, 1891.</i>	91.6.20.3	13 $\frac{3}{4}$	5 $\frac{3}{8}$	2 $\frac{7}{8}$
Cervicapra arundinum. Reedbuck..... <i>Purchased, 1846.</i>	46.4.2.10	15 $\frac{7}{8}$	6 $\frac{1}{4}$	14 $\frac{1}{4}$
Cervicapra fulvorufula. Mountain Reedbuck..... <i>Presented by Lord Hindlip, 1902.</i>	2.12.2.1	5 $\frac{5}{8}$	4 $\frac{3}{8}$	4
Cervicapra redunda. Bohor Reedbuck..... <i>Purchased from Sir John Kirk, 1882.</i>	82.1.27.2	13 $\frac{3}{4}$	5 $\frac{1}{8}$	8 $\frac{1}{4}$
Pelea capreolus. Vaal Rhebok..... <i>Presented by Dr. Burchell.</i>	629 a	8 $\frac{5}{8}$	2 $\frac{1}{2}$	2 $\frac{5}{8}$
Cobus ellipsiprymnus. Waterbuck..... <i>Presented by F. C. Selous, Esq., 1883.</i>	83.7.28.6	33	9 $\frac{3}{8}$	11 $\frac{1}{2}$
Cobus defassa. Defassa Waterbuck..... <i>Presented by Sir H. H. Johnston, K.C.B., 1901.</i>	1.8.9.125	34 $\frac{1}{8}$	8 $\frac{3}{4}$	20 $\frac{1}{4}$
Cobus mariae. Mrs. Gray's Kob..... <i>Purchased from Consul J. Petherick, 1859.</i>	59.9.28.8	26 $\frac{7}{8}$	6 $\frac{7}{8}$	13 $\frac{3}{4}$

Cobus leucotis. White-eared Kob <i>Purchased from Consul J. Petherick, 1859.</i>	59.9.23.5	19 $\frac{1}{2}$	6 $\frac{3}{8}$	7 $\frac{1}{4}$
Cobus cob. Buffon's Kob <i>Presented by the Earl of Derby, 1846.</i>	46.10.17.5	9 $\frac{1}{2}$	5	3
Cobus vaughani. Vaughan's Kob <i>Presented by Capt. P. E. Vaughan, 1906.</i>	6.10.20.1	18	5 $\frac{3}{4}$	7 $\frac{3}{4}$
Cobus thomasi. Uganda Kob <i>Presented by Sir H. H. Johnston, K.C.B., 1889.</i>	89.1.2.6	20 $\frac{1}{4}$	7 $\frac{1}{4}$	8 $\frac{3}{8}$
Cobus leche. Lichi or Lechwe <i>Purchased from F. C. Selous, Esq., 1881.</i>	81.7.27.2	27 $\frac{1}{2}$	10 $\frac{3}{4}$	19 $\frac{1}{2}$
Cobus vardonii. Puku <i>Presented by Sir A. Sharpe, K.C.B., 1894.</i>	94.3.8.10	16 $\frac{1}{4}$	6 $\frac{5}{8}$	8 $\frac{1}{2}$
Oreotragus saltator. Klipspringer	??	3 $\frac{3}{4}$	2	17 $\frac{1}{2}$
Raphicerus campestris. Steinbok <i>Presented by J. ff. Darling, Esq., 1897.</i>	97.8.25.1	4 $\frac{1}{2}$	1 $\frac{3}{4}$	2 $\frac{1}{4}$
Oribia nigricaudata. Black-tailed Oribi <i>Presented by C. B. Mosse, Esq., 1876.</i>	76.2.30.3	3	1 $\frac{5}{8}$	2 $\frac{3}{4}$
Oribia montana. Mountain Oribi <i>Purchased from E. Gerrard, 1873.</i>	73.8.29.10	4 $\frac{3}{8}$	1 $\frac{3}{4}$	2 $\frac{1}{2}$
Oribia oribi. Oribi <i>Presented by J. ff. Darling, Esq., 1897.</i>	97.8.25.4	6 $\frac{1}{4}$	2 $\frac{1}{4}$	2 $\frac{1}{2}$
Tetracerus quadricornis. Four-horned Antelope <i>Presented by Lt.-Col. J. Evans, 1889.</i>	89.11.20.18	(back horn) 4 (front horn) 2 $\frac{1}{2}$	17 $\frac{1}{2}$ 17 $\frac{1}{8}$	3 1 $\frac{1}{4}$

List of Horns, Antlers, and Tusks.

HOLLOW-HORNED RUMINANT HORNS (continued).

	No.	Length. in.	Girth. in.	Tip to tip. in.
Cephalophus sylvicultor. Yellow-backed Duiker <i>Purchased from E. Gerrard, 1878.</i>	78.7.16.3	6 $\frac{3}{4}$	3 $\frac{3}{4}$	4 $\frac{1}{2}$
Cephalophus grimmii. Cape Duiker-bok <i>Purchased from F. C. Selous, Esq., 1883.</i>	83.7.27.3	4 $\frac{1}{2}$	2 $\frac{1}{4}$	2 $\frac{7}{8}$
Connochætes taurinus. Brindled Gnu <i>Collected by Sir Andrew Smith, 1842.</i>	42.4.11.10	22	12	18 $\frac{3}{8}$
Connochætes gnu. White-tailed Gnu <i>Purchased from Argent, 1848.</i>	48.8.29.1	20 $\frac{1}{4}$	17 $\frac{1}{2}$	12
Bubalis boselaphus. Bubal Hartebeest <i>Presented by the Zoological Society, 1859.</i>	64.1 c. 59.2.10.1	15 $\frac{1}{2}$	8 $\frac{1}{2}$	7 $\frac{3}{4}$
Bubalis major. Western Hartebeest <i>Purchased from E. Blyth, Esq., 1869.</i>	69.2.9.1	20 $\frac{3}{8}$	10 $\frac{1}{4}$	7
Bubalis tora. Tora Hartebeest <i>Purchased from Rowland Ward, Ltd., 1894.</i>	94.4.26.1	20	9 $\frac{5}{8}$	15 $\frac{5}{8}$
Bubalis swaynei. Swayne's Hartebeest <i>Presented by Dr. P. L. Slater, 1892.</i>	92.5.10.1	16 $\frac{5}{8}$	9 $\frac{1}{4}$	20 $\frac{1}{4}$
Bubalis cokei. Coke's Hartebeest <i>Purchased from F. J. Jackson, Esq., 1892.</i>	92.10.18.3	18 $\frac{1}{2}$	10 $\frac{1}{4}$	14 $\frac{1}{2}$
Bubalis cama. Cape Hartebeest <i>Collected by Sir Andrew Smith, 1842.</i>	42.4.11.6	23 $\frac{3}{4}$	10	8 $\frac{3}{8}$

Bubalis jacksoni. Jackson's Hartebeest <i>Purchased from Rowland Ward, Ltd., 1900.</i>	0.4.5.1	23	11	8 $\frac{3}{4}$
Bubalis lichtensteini. Lichtenstein's Hartebeest <i>Purchased, 1889.</i>	89.7.1.3	19	11 $\frac{1}{2}$	4 $\frac{7}{8}$
Damaliscus hunteri. Hunter's Hartebeest <i>Presented by Dr. P. L. Sclater, 1903.</i>	3.1.13.2	26 $\frac{3}{8}$	8 $\frac{1}{4}$	14 $\frac{1}{2}$
Damaliscus corrigum. Senegal Hartebeest <i>Presented by the Earl of Derby, 1846.</i>	64.3 c. 46.10.23.12	19	6 $\frac{1}{4}$	10
Damaliscus tiang. Tiang Hartebeest <i>Presented by R. McD. Hawker, Esq., 1901.</i>	1.8.8.48	22 $\frac{3}{4}$	8 $\frac{3}{4}$	9
Damaliscus jimela. Jimela Hartebeest <i>Purchased from F. J. Jackson, Esq., C.B., 1893.</i>	93.4.10.4	15 $\frac{1}{2}$	6 $\frac{1}{2}$	3 $\frac{1}{4}$
Damaliscus pygargus. Bontebok <i>Purchased from Warwick, 1848.</i>	48.7.13.6	10 $\frac{3}{8}$	6 $\frac{3}{4}$	9 $\frac{1}{8}$
Damaliscus albifrons. Blesbok <i>Purchased from F. C. Selous, Esq., 1896.</i>	96.11.28.1	15 $\frac{1}{4}$	6 $\frac{1}{2}$	10
Damaliscus lunatus. Sassaby <i>Collected by Sir Andrew Smith, 1842.</i>	42.4.11.5	15 $\frac{1}{4}$	8	12 $\frac{1}{4}$

C.—PRONGBUCK HORNS.

Antilocapra americana. Prongbuck <i>Presented by Captain G. Pearson, 1905.</i>	5.5.14.1	14 $\frac{1}{2}$	5 $\frac{3}{4}$	11 $\frac{3}{4}$
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List of Horns, Antlers, and Tusks.

D.—DEER ANTLERS.

	No.	Length. in.	Girth. in.	Tip to tip. in.	Points.
Rangifer tarandus arcticus. Barren Ground Reindeer or Caribou <i>Purchased from Argent, 1851.</i>	51.10.24.1	57½	5¼	13½	13+7
Rangifer tarandus osborni. Osborn's Caribou <i>Presented by F. C. Selous, Esq., 1907.</i>	7.3.11.1	57¼	5¾	29¼	18+10
Aloes machlis. Elk or Moose <i>Presented by D. Davies, Esq.</i>	3.12.28.1	56	7¾	38	10+11
Cervus elaphus. Red Deer <i>Presented by St. George Littledale, Esq., 1887.</i>	87.12.22.4	46¾	5½	18	8+8
Cervus elaphus. Red Deer <i>Presented by Lord Arthur Hay.</i>	54.4.27.6	48½			
Cervus cashmirianus. Kashmir Stag <i>Presented by A. O. Hume, Esq., C.B., 1891.</i>	91.8.7.2	45½	8	35	6+6
Cervus yarcandensis. Yarkand Stag <i>Presented by H. Lennard, Esq., 1892.</i>	92.7.17.1	41½	6	31¼	6+6
Cervus affinis. Shou or Sikhim Stag <i>Presented by the Zoological Society (Dr. Campbell's Coll.), 1857.</i>	57.12.14.3	54½	6½	21½	5+5
Cervus albirostris. Lhasa Stag <i>Presented by Dr. W. G. Thorold, 1892.</i>	92.10.11.1	38	5¼	28	5+5
Cervus canadensis. Wapiti <i>Purchased from H. Ward, 1884.</i>	84.5.28.1	57	7½	35½	6+6
Cervus songaricus. Thian Shan Wapiti .. (single antler) <i>Collected by the Yarkand Mission and presented in 1879.</i>	79.11.21.51	48½	7¾	—	7

Cervus sica. Japanese Deer	85.2.23.1	16 $\frac{3}{4}$	3 $\frac{1}{8}$	13	4+4
<i>Presented by Gen. A. A. Kinloch, 1885.</i>					
Cervus hortulorum. Pekin Deer	2.10.2.2	34 $\frac{1}{4}$	5 $\frac{3}{4}$	34 $\frac{1}{2}$	5+5
<i>Presented by the Duke of Bedford, K.G., 1902.</i>					
Cervus dama. Fallow Deer	96.9.24.1	25 $\frac{1}{2}$	4	14	11+8
<i>Presented by the Duke of Bedford, K.G., 1896.</i>					
Do. <i>Not identified</i>	26 $\frac{7}{8}$	$\frac{3}{4}$	12	10+7
Cervus unicolor. Indian Sambar	79.11.21.444	45 $\frac{1}{8}$	6 $\frac{5}{8}$	17 $\frac{3}{4}$	3+3
<i>Transferred from the India Museum (collected by Dr. H. Falconer), 1879.</i>					
Cervus swinhoei. Formosan Sambar	1414 a	19 $\frac{3}{4}$	3 $\frac{1}{4}$	9	3+3
<i>Presented by the Zoological Society.</i>					
Cervus philippinus. Philippine Sambar	53.10.6.2	19 $\frac{5}{8}$	5 $\frac{1}{4}$	7 $\frac{1}{2}$	3+3
<i>Purchased from Argent, 1853.</i>					
Cervus hippelaphus. Rusa Deer	45.1.8.114	37 $\frac{1}{2}$	5	16 $\frac{3}{4}$	3+3
<i>Presented by B. H. Hodgson, Esq., 1845.</i>					
Cervus porcinus. Hog-Deer	1.9.7.2	21 $\frac{5}{8}$	3 $\frac{1}{4}$	6 $\frac{5}{8}$	3+3
<i>Presented by E. le F. Davys, Esq., 1901.</i>					
Cervus axis. Chital	91.8.7.38	36	4 $\frac{1}{4}$	25 $\frac{1}{4}$	3+4
<i>Presented by A. O. Hume, Esq., C.B., 1891.</i>					
Cervus duvauceli. Swamp-Deer	45.1.8.128	36	5	29 $\frac{3}{4}$	6+5
<i>Presented by B. H. Hodgson, Esq., 1845.</i>					
Cervus schomburgki. Schomburgk's Deer	65.11.2.3	30 $\frac{1}{8}$	5	15 $\frac{5}{8}$	10+10
<i>Purchased from Sir R. Schomburgk, 1865.</i>					
Cervus eldi. Thamin	45.1.8.126	35 $\frac{1}{2}$	5	30 $\frac{1}{2}$	4+4
<i>Presented by B. H. Hodgson, Esq., 1845.</i>					

List of Horns, Antlers, and Tusks.

DEER ANTLERS (continued).

	No.	Length. in.	Girth. in.	Tip to tip. in.	Points.
<i>Cervulus muntjac</i> . Muntjac	43.1.26.13	6½	2½	3½	2
<i>Presented by B. H. Hodgson, Esq., 1843.</i>					
<i>Capreolus caprea</i> . Roebuck	93.1.3.1	8½	3	4½	3
<i>Presented by Earl Cawdor, 1893.</i>					
<i>Capreolus pygargus</i> . Siberian Roe	98.12.15.2	13¾	3	6	3
<i>Presented by Henry Elwes, Esq., 1898.</i>					
<i>Elaphurus davidianus</i> . Père David's Deer	98.2.25.2	31	4¾	23	6+7
<i>Presented by the Duke of Bedford, K.G., 1898.</i>					
<i>Dorcclaphus americanus</i> . White-tailed Deer	681 d	25	5	12½	6+10
<i>No history.</i>					
<i>Dorcclaphus hemionus</i> . Mule-Deer	72.12.12.3	19½	6½	11	5
<i>Purchased from H. Ward, 1872.</i>					
<i>Dorcclaphus dichotomus</i> . Marsh-Deer	71.6.20.2	23¾	5½	15¾	5+4
<i>Purchased from Cutter, 1871.</i>					
<i>Dorcclaphus bezoarticus</i> . Pampas Deer	686 f. 54.8.16.4	14½	2½	13½	3+3
<i>Bravard Collection, 1854.</i>					
<i>Xenelaphus antisiensis</i> . Chilean Guemal	74.3.27.1	9½	7½	4½	2+2
<i>Purchased from H. Whiteley, 1874.</i>					
<i>Xenelaphus bisulcus</i> . Patagonian Guemal	99.2.4.15	10½	3½	7½	2+2
<i>Presented by the Zoological Society, 1898.</i>					

E.—ELEPHANT TUSKS.

	No.	Length. in.	Girth. in.	Weight. lbs.
Elephas africanus. African Elephant <i>Purchased, 1901.</i>	1.8.25.1	121½	24	228
Elephas maximus. Indian Elephant <i>Bequeathed by Col. G. M. Payne, 1900.</i>	0.2.26.1	75½	17¼	77

F.—WALRUS TUSKS.

Odobæenus obesus. Pacific Walrus <i>Presented by Major G. E. H. Barrett-Hamilton, 1897.</i>	97.1.18.1	25½	8½	—
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G.—NARWHAL TUSKS.

Monodon monoceros. Narwhal <i>No history.</i>	No number	103¾	7¼	—
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